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MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 61

DECEMBER, 1931

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Inspection of Agricultural  
Lime Products

By H. D. Haskins and H. R. DeRose

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This is the twentieth report on the inspection of agricultural lime products in Massachusetts. It gives the composition of the various products which have been sold, supplemented by comparative costs of units of effective oxides present. Definitions are given for the various lime products used in agriculture.

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Massachusetts State College

Amherst, Mass.

# INSPECTION OF AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1931

By H. D. Haskins, Official Chemist, assisted by H. R. DeRose.

## Manufacturers and Brands.

During 1931, seventeen firms registered for sale in Massachusetts twenty-five brands of agricultural lime and one of gypsum or land plaster. The products are grouped as follows:

Hydrated or slaked lime	12
Ground limestone	13
	<hr/>
	25
Gypsum	1

The drawing of samples took place during the months of April, May and June in widely scattered localities in the State by the same sampling agents who drew the official fertilizer samples. Ten per cent of the sacks present were sampled by means of a tube which secured a core the entire length of the package. At least ten bags were sampled provided that number was present. It is believed, therefore, that the analyses which follow fairly represent the lime products which were sold in Massachusetts for agricultural purposes during the year. All of the products registered were analyzed, and it is believed that the list includes all of the lime products that were actually sold for application to the soil, with the exception of some of the local lime by-products such as gas-house lime which are exempt from registration.

## Variations and Deficiencies in the Composition of Lime Products.

In Table I, devoted to hydrated limes, no serious deficiencies are shown. Two cases were noted where slight deficiencies in calcium oxide occurred. An overrun of magnesium oxide, however, more than made up for the calcium shortage, so that the neutralizing effect of the product was not impaired and there was no commercial shortage.

In Table II, devoted to ground limestone, no serious deficiencies are shown. The efficiency of some of the products could be materially improved, however, by finer grinding, as the rapidity with which ground limestone becomes available in the soil depends in a large degree upon the fineness of the product. As illustrating this point, Hartwell<sup>1</sup>, former director of the Rhode Island Experiment Station, found that unsifted ground limestone (of which 56 per cent was finer and 44 per cent coarser than 80 mesh, 31 per cent was coarser than 40 mesh, and 12 per cent coarser than 20 mesh) was about 80 per cent as effective on mangels and carrots as was slaked lime used in amounts to furnish the same quantity of calcium and magnesium oxides as the limestone. On the other hand, that portion of the same limestone ground to pass an 80-mesh sieve showed an average effectiveness of 102 as compared with hydrated lime at 100.

## Lime Definitions.

The following definitions of lime products used in agriculture were adopted as official by the Association of Official Agricultural Chemists at their meeting in November, 1931.

<sup>1</sup> Circular, Extension News Service, R. I. State College, Vol. 1, No. 6, Nov. 1914.



Quicklime, burned lime, caustic lime, lump lime, unslaked lime, are liming materials that have a high content of calcium oxide, with magnesium oxide, produced by heating suitable carbonates until substantially all the carbon dioxide has been eliminated.

Hydrated or slaked lime is the product obtained by treating quicklime with sufficient water or steam to combine with its oxides.

Air-slaked lime is the product obtained by exposing quicklime or hydrated lime to the atmosphere until partially carbonated.

Ground limestone is the product obtained by grinding calcareous or dolomitic limestone. Not less than seventy-five per cent (75%) shall pass a 100-mesh sieve. It shall contain calcium and magnesium carbonates equivalent to not less than ninety per cent (90%) of calcium carbonate.

Ground shell lime is the product obtained by grinding the shells of mollusks. Not less than seventy-five per cent (75%) shall pass a 100-mesh sieve. It shall contain calcium and magnesium carbonates equivalent to not less than eighty per cent (80%) of calcium carbonate.

Marl, ground shell marl, is the product obtained by grinding natural deposits of shell marl. Not less than seventy-five per cent (75%) shall pass a 100-mesh sieve. It shall contain calcium and magnesium carbonates equivalent to not less than eighty per cent (80%) of calcium carbonate.

Waste lime, by-product lime, is any industrial waste or by-product containing calcium or calcium and magnesium in forms that will neutralize acids. It may be designated by the prefixation of the name of the industry or process by which it is produced, i.e., gas-house lime, tanners' lime, acetylene lime-waste, lime-kiln ashes, calcium silicate, etc.

Gypsum, land plaster, or crude calcium sulfate, are products consisting chiefly of calcium sulfate. They may contain twenty per cent (20%) of combined water. (They do not neutralize acid soils.)

### Explanation of Tables of Analyses.

Table I, "Proportion of total oxides as carbonates." The data furnished in this column are calculated from an actual determination of carbon dioxide ( $\text{CO}_2$ ). Calcium or magnesium not in the form of carbonate is present either as hydrated lime (water- or air-slaked) or as burned lime (caustic or unslaked). It should be understood that all of the products listed in this table have at some time been burned, and the proportion of oxides present as carbonates indicates to what extent the product has absorbed carbonic acid from the air.

"Pounds of effective oxides in one ton" represents the sum of the calcium and magnesium oxides in one ton of the lime product, assuming that both ingredients from this source will become readily available.

The calculations found in column "Cost of 100 pounds of effective oxides" are based on prices furnished by the producers.

Table II, "Pounds of effective oxides in one ton." In securing these data the degree of fineness to which the limestone has been ground is taken into consideration. On those products which are finely ground so that all of the material will pass through a 20-mesh sieve, it is assumed that all of the calcium and magnesium oxides will become available in the soil within a five-year period. On those products which will not wholly pass a 20-mesh sieve, it is assumed that the oxides in that portion which is coarser than 20-mesh will be only 50 per cent effective during the same period.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass the various meshed sieves mentioned.

In both tables the figures in parenthesis following the brand name show the number of samples collected and analyzed.

Table I. Hydrated or Slaked Lime

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		Proportion of Total Oxides as Carbonates.	Pounds of Effective Oxides in One Ton.	Cost of 100 Pounds of Effective Oxides, Basis Car Lots, Paper Sacks, F.O.B. Plant, Sight Draft with Bill of Lading.
	Found.	Guar- anteed.	Found.	Guar- anteed.			
Howard D. Brewer, 45 Arctic St., Worcester, Mass. (a) Producto Agricultural Hydrated Lime (1) . . . . . Producto Agricultural Lime (2) . . . . .	71.32 64.44	60.00 60.00	2.00 5.69	1.00 1.00	1/9 1/5	1466 1403	\$0.51 .36
Burton K. Harris, P. O. Box 23, Saylesville, R. I. . . . . Dexter Agricultural Lime (2) . . . . .	50.50	50.00	22.47	20.00	1/18	1459	.71
Hoosac Valley Lime Co., Inc., Adams, Mass. Adams Land Lime (1) . . . . .	57.01	58.00	1.84	.50	1/2	1177	.50
Lawrence Portland Cement Co., Thomaston, Maine (b) Dragon Mainrok Agricultural Hydrated Lime (2) . . . . .	68.75	60.00	1.56	.50	3/7	1406	.49
Lee Lime Corporation, Lee, Mass. Agricultural Hydrated Lime (3) . . . . .	47.50	46.00	30.83	30.00	1/20	1567	.53
Miller Lime Products Corporation, West Stockbridge, Mass. Agra Land Lime (Hydrate) (2) . . . . .	51.48	45.00	10.19	8.00	1/2	1233	.60
New England Lime Co., Pittsfield, Mass., (c) Agricultural Hydrated Lime (Canaan) (1) . . . . . Agricultural Hydrated Lime (Adams) (2) . . . . .	40.55 66.71	40.00 66.00	28.18 1.25	15.00 1.00	1/5 1/3	1375 1339	.51 .52
Rockland and Rockport Lime Corporation, 3 Warren St., Winchester, Mass., (b) R-R Land Lime (5) . . . . .	60.55	60.00	3.23	.50	1/4	1276	.47
United States Gypsum Co., 300 West Adams St., Chicago, Ill., (d) U. S. G. Agricultural Lime (Farnams) (3) . . . . . U. S. G. Agricultural Hydrated Lime (Farnams) (3) . . . . .	63.96 69.51	60.00 70.00	2.03 1.98	.00 .30	1/2 1/9	1320 1430	.49 .63

a Plant at Winooski, Vermont.

b Plant at Rockland, Maine.

c Plants at Adams, Mass., and Canaan, Conn.

d Plants at Farnams, Mass., and Falls Village, Conn.

Table II. Ground Limestone.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		CARBONATES OF LIME AND MAGNESIA.		Pounds of Effective Oxides in One Ton.	Cost of 100 Pounds of Effective Oxides (a)	MECHANICAL ANALYSIS (PER CENT).					
	Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.			Finer than 100-mesh.	Between 80 and 100-mesh.	Between 60 and 80-mesh.	Between 40 and 60-mesh.	Between 20 and 40-mesh.	Coarser than 20-mesh
American Agricultural Chemical Co., North Weymouth, Mass. (b)														
Fine Ground Limestone (3) . . . Howard D. Brewer, 45 Arctic St., Worcester, Mass. (c)	31.29	30.00	20.33	19.00	98.36	93.29	1032	\$0.44	51.04	3.72	14.67	16.84	13.73	0
Producto Agricultural Limestone (1) Connecticut Agstone Co., 307 Main St., Danbury, Conn.	50.78	44.00	1.98	.50	94.76	90.00	1036	.43	65.69	1.40	5.60	6.89	16.80	3.62
Phoenix Brand Limestone (3) . . Dominion Lime Co., East Angus, Quebec, Canada	35.37	35.00	4.01	1.00	71.51d	75.00	775	.52	67.74	1.51	7.71	7.20	12.60	3.24
Dudwell Brand Agricultural Lime- stone (2)	51.08	52.00	1.98	.50	95.29	94.00	1048	.32	63.40	1.10	4.28	8.44	20.28	2.50
Grangers Manufacturing Co., West Stockbridge, Mass.														
Grangers Agricultural Limestone (5)	40.38	35.00	7.03	1.00	86.76	90.00	948	.45	92.88	2.14	3.34	.94	.70	0
Hoosac Marble, Co., North Adams, Mass.														
Ground Limestone (3) . . . Ground Limestone (1) . . . Hoosac Valley Lime Co., Inc., Adams, Mass.	53.51 53.28	53.63 53.63	.71 .65	1.00 1.00	96.97 96.44	97.00 97.00	1084 1079	.43 .43	95.86 94.10	1.31 2.30	2.83 2.93	0 .44	0 .23	0
Adams Agricultural Limestone (2) Miller Lime Products Corporation, West Stockbridge, Mass.	53.10	50.00	.84	.75	96.52	97.00	999	.38	31.68	1.82	7.54	7.81	36.32	14.83
Monarque Agricultural Limestone (3)														
New England Lime Co., Pittsfield, Mass. (e)	42.09	35.00	8.72	6.00	93.35	90.00	1016	.38	69.58	2.90	7.36	8.44	11.72	0
Agricultural Ground Limestone (4) Pownal Lime Co., North Wey- mouth, Mass. (f)	53.40	45.00	.94	.50	97.26	80.00	1087	.41	67.34	3.18	10.70	9.42	9.36	0
Pownal Agricultural Limestone (7) Donald U. Smith, Ashley Falls, Mass.	44.12	45.00	5.43	5.00	90.09	90.00	991	.45	82.50	1.16	3.80	5.54	7.00	0
Ashley White Agricultural Lime- stone (2)														
Solvay Process Co., Syracuse, N.Y. Solvay Pulverized Limestone (1)	31.02	30.00	20.47	19.00	98.17	93.29	1030	.39	52.38	4.58	14.20	20.04	8.80	0
United States Gypsum Co., 300 West Adams St., Chicago, Ill. (g)	46.96	46.50	3.26	1.50	90.62	86.14	1004	.46	74.24	1.85	8.90	8.40	6.61	0
U. S. G. Agricultural Limestone (3)	30.97	29.00	20.28	20.00	97.68	95.00	1025	.44	48.98	5.70	23.25	18.68	3.39	0

a Basis car lots, in paper sacks. f. o. b. plant, sight draft, with bill of lading.

b Plant at Ashley Falls, Mass.

c Plant at Winoski, Vt.

d There was 26.75 % of material insoluble in dilute hydrochloric acid.

e Plant at Adams, Mass.

f Plant at North Pownal, Vt.

g Plant at Falls Village, Conn.

Table III. Gypsum or Land Plaster.

Name of Manufacturer and Brand.	Calcium Oxide (CaO).		Calcium Sulfate (CaSO <sub>4</sub> ).		Calcium and Magnesium Carbonates (CaCO <sub>3</sub> - MgCO <sub>3</sub> ). Found.
	Found.	Guar- anteed.	Found.	Guar- anteed.	
United States Gypsum Co., 300 West Adams St., Chicago, Ill. Agricultural Gypsum . . . . .	32.94	30.00	70.59	64.50	8.73

Note:—The small amount of calcium and magnesium carbonates present in gypsum would neutralize sour soils: the calcium sulfate would not be effective for this purpose.

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# MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 62

FEBRUARY, 1932

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## Seed Inspection

By F. A. McLaughlin and Margaret E. Nagle

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This Report, the fourth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1931 by the Commissioner of Agriculture, who is named in the Act as Administrative Officer (Acts and Resolves of 1927, Chapter 274.)

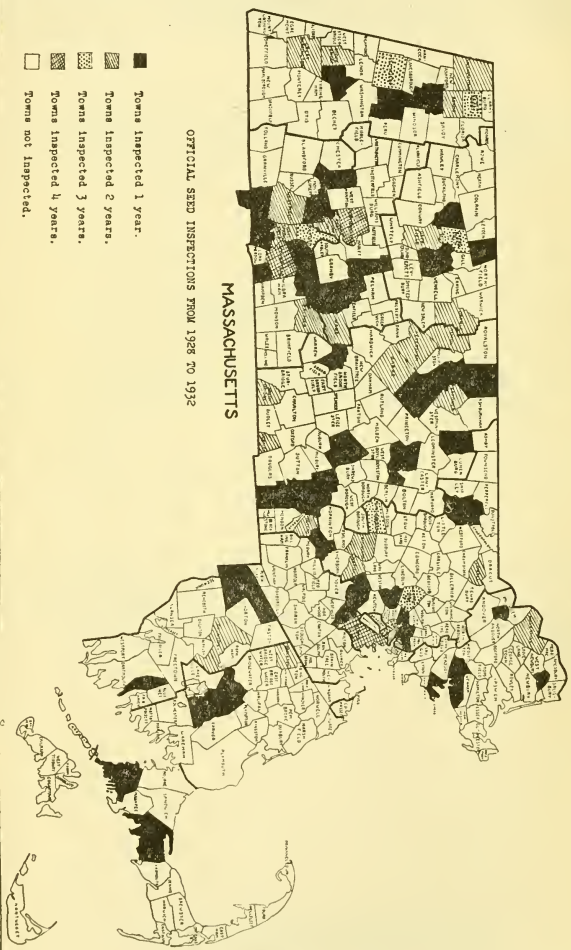
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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.

- Towns Inspected 1 year.
- ▨ Towns Inspected 2 years.
- ▩ Towns Inspected 3 years.
- ▧ Towns Inspected 4 years.
- Towns not inspected.

OFFICIAL SEED INSPECTIONS FROM 1928 TO 1932

MASSACHUSETTS



# SEED INSPECTION

By F. A. McLaughlin and Margaret E. Nagle

The first annual inspection of Massachusetts seed was conducted by the Commissioner of Agriculture in 1928. Since then inspections have been made each year—a total of four inspections since the Seed Law became effective November 1, 1927.

The accompanying map shows where inspections of dealers' stock have been made over this period of time. It will be noted that inspections have not been made in every town and city of the State, but that every year the larger centers of distribution have been covered and each year new territory has been added to that already worked. Progressively the entire State will be covered in this manner, and when this has been done it may be possible each year to cover larger portions of the State until finally each annual inspection may cover nearly, if not all, the State. In the meantime, the organization of inspection and laboratory facilities for analysis of samples collected may be perfected for handling the very much increased number of samples.

The number of samples of seed received by the Seed Laboratory has increased each year since 1928 when the laboratory was established. From October 1, 1930, to October 1, 1931, a total of 1135 samples of seed was received for analysis, germination, or both. The official samples collected by inspectors numbered 469; those sent in by seedsmen and farmers, 454; and by the Commissioner of Agriculture of Rhode Island, 212. This bulletin records analysis and germination of the official samples only. However, it includes also the results of field tests for trueness to type and variety of Alfalfa, Red Clover, Sweet Clover, Onions, and Peas. Professor Miles Cubbon of the Agronomy Department, Professor Grant B. Snyder of the Vegetable Gardening Department, and Professor O. C. Boyd, Extension Pathologist, cooperated with the Seed Laboratory in conducting these tests.

## 1931 Official Inspection of Agricultural Seeds

### Explanation of Tables

In these tables the seeds are listed in alphabetical order by groups, each group containing only those seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. Section 261-A of the Acts and Resolves of 1927, Chapter 274, defines the group from Alfalfa to Vetch, inclusive; Section 261-B, Mixtures; Section 261-C, Special Mixtures; and Section 261-D, Vegetables.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F", what was found in the laboratory analysis. Attention is called to certain irregularities by the following:

The asterisk (\*) shows violation in labeling.

Boldface type indicates low purity, low germination, excessive weed seed, or excessive inert material, depending upon the column in which it is found.

(1) Date of test indicates that this seed was matured and marketed prior to August 1, 1930.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except in those tables which list seeds falling under sections of the law not requiring purity or germination on the label. For the application of "Purity Tolerance," the sample is considered as made up of two component parts; (1) the component being considered, and (2) the balance of the sample. The tolerance in percentage allowed for each component shall be two-tenths of one per cent (0.2%) plus 20 per cent of the lesser of the two parts. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

<i>Given Germination (%)</i>	<i>Allowable Variation (%)</i>
90 or over.....	6
80 or over, but less than 90.....	7
70 or over, but less than 80.....	8
60 or over, but less than 70.....	9
Less than 60.....	10

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>ALFALFA</b>							
A-97	THE ALBERT DICKINSON CO., Chicago, Ill. Grimm Alfalfa..... Frank Howard, Pittsfield	(L. 99.44 (F. 99.57	.28 .15	— .16	—	70-23 72-9	* 8/31
A-54	Idaho Grown Grimm Alfalfa No. 27686. Ryther & Warren, Beichertown	(L. 99.00 (F. 99.64	* .25	— .08	.006 .03	* 86-4	* 8/31
A-12	FITCHBURG HARDWARE CO., Fitchburg, Mass. Grimm Alfalfa..... Montgomery Hardware, Ayer	(L. * (F. 98.61	* .39	— .48	— .52	* 77.3	* 8/31
A-40	STANFORD SEED CO., Buffalo, N. Y. Minnesota Alfalfa..... Waite Hardware Co., Webster	(L. 99.32 (F. 99.38	.27 .19	— .22	— .21	75-13 64-24	12/30 8/31
A-79	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Alfalfa..... Treat Hardware Corp., Lawrence	(L. 99.50 (F. 95.52	.43 .20	— 4.03	— .25	80-10 73-6	* 8/31
A-55	WHOLESALE UNKNOWN Idaho Alfalfa..... D. F. Howard & Co., Ware	(L. 99.00 (F. 99.54	* .18	— .22	.006 .06	* 79-4	* 8/31
<b>BARLEY</b>							
A-61	THOMAS W. EMERSON CO., Boston, Mass. Barley—2 Row (1)..... D. F. Howard & Son, Ware	(L. 98.39 (F. 99.10	.39 Trace	— .28	— .62	95 68	1/29 8/31
A-83	NARRAGANSETT MILLING CO., E. Providence, R. I. Barley—6 Row (1)..... No. Attleboro Grain Co., No. Attleboro	(L. 98.00 (F. 99.20	* Trace	— .37	— .43	90 96	1/30 8/31
<b>BENT GRASS</b>							
A-101	DOUGHTEN SEED CO., New York, N. Y. Mixed German Bent, "Re-cleaned Seeds" (1)..... Dooley Hardware Co., Springfield	(L. 73.03 (F. 74.47	.52 .58	25.96 24.82	.49 .13	73 14	3/28 8/31
A-110	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Creeping Bent (2)..... Carlisle Hardware Co., Springfield (So. German Mixed Bent)	(L. * (F. 82.52	* .23	— 16.97	— .28	* 80	* 9/31
A-102	WHOLESALE NOT GIVEN Rhode Island Bent (Colonial)..... Dooley Hardware Co., Springfield	(L. * (F. 93.82	* .37	— 5.81	— Trace	* 57	* 9/31

## BLUE GRASS

A-122	STANFORD SEED CO., Buffalo, N. Y. Canada Blue Grass W. H. George Hardware Co., Framingham	.08 .09	— 9.46	— 1.20	81-5 95(KNO <sub>3</sub> )	* 9/31
A-73	THOMAS W. EMERSON CO., Boston, Mass. Kentucky Blue Grass Waters & Brown, Salem	* 1.39	— 14.33	— .09	* 39	* 9/31
A-75	Kentucky Blue Grass C. A. Noyes Co., Brockton	2.40 1.09	— 20.68	— .04	70 43	3/31 9/31
A-108	Kentucky Blue Grass Maschin & Kratovil, Springfield	1.10 .61	— 15.12	— .04	80 60	1/31 9/31
A-20	CHAS. C. HART SEED CO., Wethersfield, Conn. Kentucky Blue Grass C. F. Paige Hardware, Athol	* .67	— 22.63	— Trace	* 51	* 11/31
A-126	STANFORD SEED CO., Pittsburg, Pa. Kentucky Blue Grass W. H. George Hardware Co., Framingham	1.00 Trace	— 19.56	— .47	70 67	* 9/31
A-65	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Kentucky Blue Grass (1) Schofield Hardware Co., No. Attleboro	.75 2.37	— 17.82	— 8.71	80 55	3/30 9/31
A-86	Kentucky Blue Grass Villeneuve Hardware, Haverhill	.51 .70	— 20.40	— .07	75 65	2/31 9/31
A-44	JOSEPH BRECK & SONS CORP., Boston, Mass. Japanese Buckwheat (1) H. S. Chadbourne Co., Milford	* .06	— .43	— .22	92 95	5/30 8/31
A-14	FITCHBURG HARDWARE CO., Fitchburg, Mass. Japanese Buckwheat (1) Montgomery Hardware, Ayer	.05 —	— .25	— .08	95 94	6/30 8/31
A-42	THE ALBERT DICKINSON CO., Chicago, Ill. Alsike Clover Webster Grain Co., Webster	.35 .44	— .27	— 1.42	85-11 88-5	11/30 8/31
A-21	JOHN B. VARICK CO., Manchester, N. H. Alsike Clover A. E. Stewart, Athol	* 1.43	— .11	— 3.52	94 79.5	* 8/31

Note:—The letters "L" and "P" indicate "Labeled" by the distributor and "Found" by the laboratory.

The \* shows the violation in labeling.

Boldface type indicates low purity, low germination, excessive weed seed, or excessive inert matter, depending upon the column in which it is found.

(1) Old stock.

(2) An old trade name for South German Mixed Bent; a term no longer correct.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>ALSIKE CLOVER—Continued</b>							
A-85	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Alsiike Clover (1)..... Villeneuve Hardware, Haverhill	98.00 (L. P. 99.28	.36 .09	— .12	— .51	90 84-2	1/30 8/31
A-51	Pan-American Alsiike..... Barre Grain Co., Barre	97.00 (L. P. 98.44	* .09	— .16	— 1.31	90 73-1	* 8/31
<b>RED CLOVER</b>							
A-26	JOSEPH BRECK & SONS CORP., Boston, Mass. Red Clover (1)..... Joseph Breck & Sons, Lexington	99.00 (L. P. 99.71	* .06	— .07	— .16	88 78-5	1/30 8/31
A-13	FITCHBURG HARDWARE CO., Fitchburg, Mass. Red Clover, #241110, Central States Grown (1,3)..... Montgomery Hardware, Ayer	98.76 (L. P. 97.91	.46 1.67	— .08	— .34	90 84-8	12/26 8/31
A-22	STANFORD SEED CO., Buffalo, N. Y. Red Clover, Ident. #5328 (1)..... Orange Hardware Co., Orange	99.13 (L. P. 98.64	.51 .86	— .20	— .30	88-4 74-10	3/30 8/31
A-92	Red Clover..... J. A. Sullivan Co., Northampton	99.13 (L. P. 99.76	.51 .21	— .01	— .02	88-4 74-9	* 8/31
A-99	Red Clover..... Newcomb Hardware Co., Greenfield	* (L. P. 98.99	* .57	— .10	— .34	* 76-14	* 8/31
A-7	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. P. A. French Red Clover..... The Fiske Corporation, Natick	98.00 (L. P. 98.91	.50 .71	.01 .11	.50 .27	90 69-7	* 8/31
A-112	Red Clover..... Carlisle Hardware Co., Springfield	* (L. P. 98.77	* .25	— .32	— .66	* 81-9	* 8/31
A-104	WHOLESALER NOT GIVEN Clover, (Red, Imported)..... Dooley Hardware Co., Springfield	* (L. P. 98.82	* .19	— .98	— .01	* 24-3	* 8/31
A-62	THOMAS W. EMERSON CO., Boston, Mass. Sweet Clover (1)..... D. F. Howard & Son, Ware	98.54 (L. P. 98.90	.28 .10	— .16	— .84	85 63	1/30 8/31



## WHITE CLOVER

A-27	JOSEPH BRECK & SONS CORP., Boston, Mass. White Clover (L) Joseph Breck & Sons Corp., Lexington	98.00 (L. (F. 97.94	* .20	— .83	— 1.03	90 59-13	5/30 8/31
A-72	White Clover B. F. Hill Hardware Co., Salem	98.00 (L. (F. 98.39	* .98	— .48	— .15	85 71-23	7/30 8/31
A-82	White Clover Pentucket Hardware Co., Haverhill	97.00 (L. (F. 99.08	* .52	— .23	— .17	90 62-11	* 8/31
A-120	White Clover Sawyer Hardware Co., Framingham	* (L. (F. 97.86	* .62	— .44	— 1.08	* 74-10	* 8/31
A-94	THE ALBERT DICKINSON CO., Chicago, Ill. White Clover Frank Howard, Pittsfield	97.40 (L. (F. 97.12	.30 .24	— .15	— 2.49	82-10 56-35	* 8/31
A-37	THOMAS W. EMERSON CO., Boston, Mass. White Clover LaPalme Hardware Co., Webster	96.45 (L. (F. 97.86	* .94	— .25	— .95	91 63-3	*/30 8/31
A-123	STANFORD SEED CO., Buffalo, N. Y. White Clover W. H. George Hardware Co., Framingham	97.57 (L. (F. 98.29	.59 .32	— .29	— 1.10	82-8 74-7	* 8/31
A-6	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. White Clover Hyannis Hardware Co., Hyannis	* (L. (F. 98.36	* .40	— .91	— .33	* 68-24	* 8/31
A-8	White Clover The Fiske Corporation, Natick	96.00 (L. (F. 97.28	* 1.19	2.00 .32	2.00 1.21	* 68-9	* 8/31
A-80	White Clover Treat Hardware Corp., Lawrence	98.00 (L. (F. 97.59	.40 .74	— .72	— .95	90 69-5	10/30 8/31
A-88	White Clover Foster-Farrar Co., Northampton	96.50 (L. (F. 95.93	1.00 .24	— .79	— 3.04	84 85-2	1/31 8/31
A-106	White Clover Maschin & Kratovil, Springfield	98.00 (L. (F. 98.79	.40 .51	— .34	— .36	90 63-12	10/30 8/31
A-111	White Clover Carlisle Hardware Co., Springfield	97.12 (L. (F. 98.43	.72 .43	— .12	— 1.02	80-7 70-9	1/31 8/31

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(1) Old Stock.

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germin- ation %	Date of Test
<b>CORN—(FIELD)</b>							
A-23	PAGE SEED CO., Greene, N. Y. West Branch Seed Corn, Lot #5166 (1) Lee Hardware Co., Athol	99.00 (L. F.) 99.90	.00 .00	— .10	— .00	91 85	4/30 8/31
A-24	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Early Canada Flint Corn H. Newell & Co., Shelburne Falls	98.00 (L. F.) 99.85	— .00	— .05	— .10	96 88	3/31 8/31
A-129	Excelsior Ensilage Wm. M. Lee Hardware Co., Clinton	* (L. F.) 99.42	— .00	— .58	— .00	* 90	* 6/31
A-45	Improved Learning Corn Webster Grain Co., Webster	98.00 (L. F.) 99.40	— .00	— .50	— .10	90 92	* 8/31
A-52	F. H. WOODRUFF & SONS, Milford, Conn. Improved Learning Field Corn H. R. Durant, Beichertown	* (L. F.) 100.00	— .00	— .00	— .00	* 95	* 8/31
A-9	WHOLESALE NOT GIVEN Corn, Learning Field, Bag #72624 J. Cushing Co., Middleboro	* (L. F.) 99.78	— .00	— .22	— .00	* 89	* 8/31
<b>FESCUES</b>							
A-128	STANFORD SEED CO., Pittsburgh, Pa. Chewings Fescue W. H. George Hardware Co., Framingham	92.74 (L. F.) 92.68	.34 .14	— 6.75	— .43	80 17	* 9/31
A-4	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Red Fescue H. V. Lawrence, Falmouth	87.05 (L. F.) 87.87	.30 .16	— 11.44	— .53	80 73	1/31 8/31
A-84	Sheep's Fescue Villeneuve Hardware Co., Haverhill	90.00 (L. F.) 90.74	.90 .61	— 8.65	— Trace	85 42	2/31 9/31
<b>MANGELS</b>							
A-2	THOMAS W. EMERSON CO., Boston, Mass. Mammoth Long Red Wurzel Mangels Chas. T. Eastman, Falmouth	* (L. F.) 99.59	* .00	— .36	— .05	* 75	* 8/31
A-11	JEROME B. RICE SEED CO., Cambridge, N. Y. Mammoth Prize Long Red Mangel Wurzel I. G. Dwinell, Ayer	* (L. F.) 96.40	* .21	— 1.60	— 1.79	* 55	* 8/31

A-29	S. D. WOODRUFF & SONS, Orange, Conn. Long Red Mangel..... Holyoke Farm Machinery Co., Holyoke	(L. (F.	* 99.90	* .00	— .10	100 81	1/31 8/31
<b>GERMAN-MILLET</b>							
A-59	N. WERTHEIMER & SONS, Buffalo, N. Y. German Millet, Kansas 1929 (1)..... Ware Grain & Coal Co., Ware	(L. (F.	* 99.56 99.60	* .26	— Trace	84 81	3/30 8/31
<b>GOLDEN-MILLET</b>							
A-115	THOMAS W. EMERSON CO., Boston, Mass. Golden Millet..... Wm. M. Lee Hardware Co., Clinton	(L. (F.	96.00 97.10	.25 .14	— .33	90 82	* 8/31
A-48	ROSS BROS. CO., Worcester, Mass. Golden Millet..... Barre Grain Co., Barre	(L. (F.	98.22 98.62	* .13	— .59	91 74	* 8/31
<b>HUNGARIAN MILLET</b>							
A-60	THE CUTLER CO., No. Wilbraham, Mass. Hungarian Millet (1)..... Ware Grain & Coal Co., Ware	(L. (F.	99.40 96.60	.18 .34	— .42 3.02	90 89	3/30 8/31
A-19	THOMAS W. EMERSON CO., Boston, Mass. Hungarian Millet, Ident. # 47-54 (1)..... Lee Hardware Co., Athol	(L. (F.	99.00 99.80	.15 .12	— .04	90 81	3/29 8/31
A-34	ROSS BROS. CO., Worcester, Mass. Hungarian Millet..... Brown Bros., Northbridge	(L. (F.	* 98.49	* 1.09	— .37	* 2	* 8/31
A-47	Hungarian Millet..... Barre Grain Co., Barre	(L. (F.	98.00 98.18	* 1.10	— Trace	90 57	* 8/31
A-70	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Hungarian Millet..... W. F. Flynn & Son, Attleboro	(L. (F.	98.50 98.09	1.10 1.08	— .82	94 85	1/31 8/31
<b>JAPANESE MILLET</b>							
A-118	THOMAS W. EMERSON CO., Boston, Mass. Japanese Millet..... VanDuzer Hardware Co., Framingham	(L. (F.	96.00 96.35	3.32 2.72	— .42	85 73	* 8/31
A-119	Japanese Millet..... VanDuzer Hardware Co., Framingham	(L. (F.	97.52 96.87	2.04 2.89	— Trace	85 89	* 8/31

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(1) Old stock.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>JAPANESE MILLET—Continued</b>							
A-96	PAGE SEED CO., Greene, N. Y. Japanese Millet..... Frank Howard, Pittsfield	(L. 98.90 (F. 97.73	.72 1.92	.38 .35	Trace Trace	90 80	* 8/31
A-41	Japanese Millet (1) Waite Hardware Co., Webster	(L. 97.81 (F. 97.46	2.04 2.40	.15 .14	Trace Trace	87 84	10/28 8/31
A-113	Page's Japanese Millet..... Wm. M. Lee Hardware Co., Clinton	(L. 98.90 (F. 97.17	.72 2.52	.38 .13	— .18	90 78	* 8/31
A-64	ROSS BROS. CO., Worcester, Mass. Japanese Millet..... E. T. Hall, West Upton	(L. * (F. 96.86	* 1.99	— 1.13	— .02	* 87	* 8/31
A-1	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Japanese Millet..... G. E. Doane, Middleboro	(L. * (F. 97.39	* 2.46	— .15	— Trace	* 88	* 8/31
A-67	F. H. WOODRUFF & SONS, Milford, Conn. Japanese Millet..... Martin's Hardware, North Attleboro	(L. 99.50 (F. 98.45	.20 .84	— .71	— Trace	90 85	3/31 8/31
<b>OATS</b>							
A-50	CHAS. M. COX CO., St. Albans, Vt. Northern Grown Oats..... Barre Grain Co., Barre	(L. 99.00 (F. 99.61	* .01	— .28	— .10	97 90	* 8/31
A-58	Northern Grown Oats..... Ware Grain & Coal Co., Ware	(L. 99.00 (F. 98.67	* .04	— .36	— .93	97 92	* 8/31
A-116	THOMAS W. EMERSON CO., Boston, Mass. Seed Oats..... VanDuzer Hardware Co., Framingham	(L. 97.00 (F. 98.74	* .12	— .10	— 1.04	95 92	* 8/31
<b>PEAS</b>							
A-43	JEROME B. RICE SEED CO., Cambridge, N. Y. Canada Peas..... H. S. Chadbourne, Milford	(L. * (F. 99.50	* .00	— .50	— .00	* 93	* 8/31



## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>RED TOP—Continued</b>							
A-32	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Red Top.....	(L. F.) 90.00 90.01	.30 .50	— 9.43	— .06	90 82	1/31 8/31
A-68	Red Top, Pan-American H. S. Chadbourne Co., Milford	(L. F.) 92.00 90.36	.77 .50	— 9.12	— .02	90 80	9/30 8/31
A-90	Red Top, Pan-American W. F. Flynn & Son, Attleboro	(L. F.) 92.00 92.02	.77 .51	— 7.21	— .26	90 90	1/31 8/31
A-78	Red Top..... Foster-Farrar Co., Northampton	(L. F.) 92.00 91.93	.77 .55	— 7.46	— .06	90 94	1/31 8/31
A-76	Red Top (1)..... Wilson Hardware Co., Newburyport	(L. F.) 92.00 90.73	.40 .30	— 8.63	— .34	90 89	4/29 8/31
A-105	WHOLESALE NOT GIVEN Red Top..... Dooley Hardware Co., Springfield	(L. F.) * 89.19	* .67	— 10.14	— Trace	* 63	* 8/31
<b>RYE</b>							
A-56	N. WERTHEIMER & SONS, Buffalo, N. Y. Spring Rye, No. Dakota 1930.....	(L. F.) 96.62 97.47	* .03	3.30 2.18	.08 .32	95 86	2/31 8/31
A-57	Ware Grain & Coal Co., Ware Winter Rye, No. Dakota 1930.....	(L. F.) 95.65 97.73	* .01	4.07 2.08	.28 .18	95 89	2/31 8/31
<b>ROUGH STALKED MEADOW GRASS</b>							
A-127	STANFORD SEED CO., Buffalo, N. Y. Rough Stalked Meadow Grass.....	(L. F.) 89.13 89.65	.10 .16	— 9.95	— .24	88 34	* 9/31
<b>RYE GRASS</b>							
A-124	THOMAS W. EMERSON CO., Boston, Mass. Domestic Rye Grass.....	(L. F.) 99.40 99.37	* .15	— .27	— .21	97 93	* 8/31
A-5	JOSEPH BRECK & SONS CORP., Boston, Mass. Perennial Rye Grass (1).....	(L. F.) 98.00 97.69	* .55	— 1.29	— .47	80 41	3/30 8/31



## SUNFLOWER

A-100	JEROME B. RICE SEED CO., Cambridge, N. Y. Mammoth Russian Sunflower S. Allen's Sons, Greenfield	L. (F.	* 98.94	.38	—	.67	91 89	* 8/31
TIMOTHY								
A-25	JOSEPH BRECK & SONS CORP., Boston, Mass. Timothy Joseph Breck & Sons Corp., Lexington	L. (F.	99.60 99.78	.12	—	.08	90-93 80	* 8/31
A-71	Timothy B. F. Hill Hardware Co., Salem	L. (F.	* 98.64	.69	—	.41	* 92	* 8/31
A-98	THE ALBERT DICKINSON CO., Chicago, Ill. Timothy Frank Howard, Pittsfield	L. (F.	99.65 99.89	.09	—	.02	95 89	* 8/31
A-87	THOMAS W. EMERSON CO., Boston, Mass. Timothy Villeneuve Hardware Co., Haverhill	L. (F.	98.00 99.64	.10	—	.25	90 94	3/31 8/31
A-33	ROSS BROS CO., Worcester, Mass. Timothy Brown Bros., Northbridge	L. (F.	99.65 99.87	.11	—	.02	95 89	1/31 8/31
A-46	Timothy H. I. Goodsell, Petersham	L. (F.	* 99.74	.09	—	.16	* 81	* 8/31
A-63	Timothy (3) E. T. Hall, West Upton	L. (F.	— 99.46	.31	—	.13	— 3	— 8/31
A-18	STANFORD SEED CO., Buffalo, N. Y. Timothy, Liberty—Ident. #2720 (1) Lee Hardware Co., Athol	L. (F.	99.60 99.62	.28	—	.06	90 79	3/30 8/31
A-31	Timothy Osborne Hardware Co., Holyoke	L. (F.	99.00 99.65	.04	—	.31	90 83	* 8/31
A-39	Timothy Waite Hardware Co., Webster	L. (F.	99.60 99.31	.41	—	.22	90 82	3/31 8/31

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## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>TIMOTHY—Continued</b>							
A-109	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Timothy (1)..... Carlisle Hardware Co., Springfield	(L. (F. 99.60 99.65	.10 .10	.20 .21	— .04	92 53	1/28 8/31
A-91	Timothy..... Hampshire Hardware Co., Northampton	(L. (F. * 99.79	* .01	— .07	— .13	* 76	* 8/31
A-81	Timothy..... Treat Hardware Corp., Lawrence	(L. (F. 99.60 99.47	.05 Trace	— .41	— .12	90 95	* 8/31
A-77	Timothy..... Winer Bros. Hardware Co., Beverly	(L. (F. 99.60 99.58	.10 .01	— .40	— .01	97 65	* 8/31
A-49	Herald Timothy..... Barre Grain Co., Barre	(L. (F. 98.88 99.42	.12 .05	— .39	— .14	90 80	* 8/31
A-69	Pan-American Timothy..... W. F. Flynn & Son, Attleboro	(L. (F. 99.60 99.44	.05 .11	— .29	— .16	90 78	1/31 8/31
A-89	Pan-American Timothy..... Foster-Farrar Co., Northampton	(L. (F. 99.60 99.83	.05 .01	— .09	— .07	90 83	1/31 8/31
A-107	Pan-American Timothy..... Maschin & Kratovil, Springfield	(L. (F. 99.60 99.38	.05 .01	— .16	— .45	90 88	1/31 8/31
A-66	Pan-American Timothy..... Schofield Hardware Co., North Attleboro	(L. (F. 99.60 99.42	.05 .11	— .46	— .01	90 94	1/31 8/31
A-3	F. H. WOODRUFF & SONS, Milford, Conn. Timothy..... Falmouth Plumbing & Hardware, Falmouth	(L. (F. * 99.79	* .02	— .08	— .11	* 42	* 8/31
A-103	WHOLESALE NOT GIVEN Timothy..... Dooley Hardware Co., Springfield	(L. (F. * 99.02	* .12	— .44	— .42	* 92	* 8/31

## MIXTURES

JOSEPH BRECK & SONS CORP., Boston, Mass.  
 Timothy\* ..... (L.  
 Sawyer Hardware Co., Framingham  
 Timothy and Red Top

A-121

\* ..... 97.00 ..... 92 ..... \*

(F. Timothy 63.01 ..... 87 ..... 8/31  
 (F. Red Top 33.42 ..... 94 ..... 8/31  
96.43 ..... .73

THOMAS W. EMERSON CO., Boston, Mass.  
 White Clover\* ..... (L.  
 Harvey A. Woods, Groton  
 White Clover and Alsike

A-10

\* ..... \* ..... \*

F. White 93.31 ..... 74-9 ..... 8/31  
 (F. Alsike 5.30 ..... 58-6 ..... 8/31  
98.61 ..... .42

A-16

White Clover\* (1) ..... (L.  
 Lee Hardware Co., Athol  
 White Clover and Alsike

..... .82 ..... 96 ..... 11/29  
 (F. White 91.87 ..... 40-18 ..... 8/31  
 (F. Alsike 5.20 ..... 33-11 ..... 8/31  
97.07 ..... 1.37

A-74

Chewings Fescue\* (3) ..... (L.  
 C. A. Noyes Co., Brockton  
 Timothy and Red Clover

..... - ..... - ..... -

(F. Timothy 72.91 ..... 81 ..... 9/31  
 (F. R. C. 21.45 ..... 74-3 ..... 9/31  
94.35 ..... 3.72

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## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES					
C 16	JOSEPH BRECK & SONS CORP., Boston, Mass.				
	Bank and Terrace Mixture.....	(L.,	*	*	—
	(Ingredients not named)				
	Joseph Breck & Sons Corp., Lexington.	(F.,			
	English Perennial Ryegrass.....	20.73			
	Kentucky Bluegrass.....	17.40			
	Red Top.....	14.75			
	Red Fescue.....	14.28			
	Orchard Grass.....	13.04			
	Crested Dog's-tail.....	4.57			
C-14	Boston Park Lawn Mixture.....	(L.,			
	Kentucky Bluegrass, Red Top,		1.00	11.00	—
	Meadow Fescue, White Clover				
	Joseph Breck & Sons Corp., Lexington.....	(F.,			
	Red Top.....	36.96			
	Kentucky Bluegrass.....	35.20			
	Meadow Fescue.....	13.91			
	White Clover.....	5.42			
	Boston Park Lawn Grass Mixture.....	(L.,			
	(Ingredients not named)				
C 51	Henry L. Sawyer Co., Framingham.....				
	Red Top.....	(F.,			
	Kentucky Bluegrass.....	50.15			
	White Clover.....	31.64			
	Meadow Fescue.....	4.58			
	Boston Park Lawn Grass Mixture.....	(L.,			
	(Ingredients not named)				
	Henry L. Sawyer Co., Framingham.....				
	Red Top.....	91.37			
	Kentucky Bluegrass.....	90.61			
C-35	Breck's Special, Setab Brand Mixture.....	(L.,			
	Clean Red Top, Timothy.....				
	Kentucky Bluegrass, White Clover				
	D. Cashman Hardware Co., Newburyport.....	(F.,			
	Red Top.....	65.14			
	Timothy.....	10.02			
	Kentucky Bluegrass.....	7.08			
	White Clover.....	6.38			
	Breck's Special, Setab Brand Mixture.....	(L.,			
	Clean Red Top, Timothy.....				
C-37	Setab Brand Mixture.....	(L.,			
	Clean Red Top, Kentucky Bluegrass,				
	Timothy, White Clover*				
	Clean Red Top, Timothy.....				
	Kentucky Bluegrass, White Clover				
	D. Cashman Hardware Co., Newburyport.....	(F.,			
	Red Top.....	88.62			
	Timothy.....	7.04			
	Kentucky Bluegrass.....	3.68			
	White Clover.....				
Setab Brand Mixture.....	(L.,				
Clean Red Top, Kentucky Bluegrass,					
Timothy, White Clover*					

## SEED INSPECTION

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C-38	Pentucket Hardware, Haverhill.....	(F,	91.17	.60	7.93	.30
	Red Top.....		67.60			
	Timothy.....		14.32			
	Kentucky Bluegrass.....		5.98			
	White Clover.....		3.27			
	Setab Brand Mixture.....	(L,	90.00	.40	9.60	-
	Clean Red Top, Timothy,					
	Kentucky Bluegrass, White Clover					
	L. D. Winer Hardware, Salem.....	(F,	93.83	.51	5.66	Trace
	Red Top.....		57.33			
C-52	Timothy.....		17.27			
	White Clover.....		14.23			
	Kentucky Bluegrass.....		5.00			
	Setab Brand, Breck's Special Mixture	(L,	90.00	.40	9.60	-
	Red Top, Kentucky Bluegrass*,					
C-54	Timothy, White Clover.....	(F,	91.75	.47	7.55	.23
	Henry L. Sawyer Co., Framingham					
	Red Top.....		60.23			
	Timothy.....		19.06			
	White Clover.....		8.07			
	Kentucky Bluegrass.....	(L,	90.00	.40	9.60	-
	Setab Brand, Lawn Grass.....	(F,	91.93	.27	7.63	.17
	(Ingredients not named)					
	White Hardware Co., Framingham					
	Red Top.....		61.47			
C-15	Timothy.....		17.31			
	White Clover.....		6.90			
	Kentucky Bluegrass.....	(L,	73.40	1.15	24.45	-
	Shady Spot Lawn Mixture.....					
	Red Top, Kentucky Bluegrass,	(F,	83.61	.53	14.37	1.49
	Rough Stalked Meadow and Fescue*					
	Joseph Breck & Sons Corp., Lexington					
	Red Top.....		27.54			
	Kentucky Bluegrass.....		14.75			
	Rough Stalked Meadow Grass		36.84			
C-53	Fine Leaved Fescue.....	(L,	73.40	1.15	25.45	-
	Breck's Shady Spot.....					
	Red Top, Kentucky Bluegrass,					
	Rough Stalked Meadow Grass, Fescue*					
	Henry L. Sawyer Co., Framingham.....	(F,	87.39	.23	11.46	.92
	Rough Stalked Meadow Grass					
	Kentucky Bluegrass.....		54.06			
	Red Top.....		19.25			
	Fine Leaved Fescue.....		13.42			
			.66			

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## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Wholesale Distributor, Brand or Trade Name of Mixture,  
Dealer, Place Collected, Name and Percentage  
of Ingredients in each Mixture

Lab. No.	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES—Continued</b>				
<b>JOSEPH BRECK &amp; SONS CORP., Continued</b>				
C-5	—	*	*	—
	(L.)			
Lawn Grass Mixture.....				
(Ingredients not named)				
Peboco Hardware Co., Wellesley.....	(P.)	.52	7.64	.15
Red Top.....	70.17			
Kentucky Bluegrass.....	4.09			
Timothy.....	13.01			
White Clover.....	4.42			
<b>COMSTOCK, FERRE &amp; CO., Wethersfield, Conn.</b>				
C-42	—	.76	15.20	—
	(L.)			
Lawn Grass.....				
Red Top, Kentucky Blue,				
Red Fescue, Rye Grass*				
Foster-Farrar Co., Northampton.....	(P.)	.71	15.89	4.37
Red Top.....	34.74			
Kentucky Bluegrass.....	19.11			
Domestic Ryegrass.....	18.71			
Red Fescue.....	6.47			
<b>C-43</b>				
	(L.)	.49	13.15	—
Shady Place Lawn Grass.....				
Red Top, Kentucky Blue, Red Fescue,				
Ryegrass,* P. E. I. Bent, R. S. Meadow				
Foster-Farrar Co., Northampton.....	(P.)	.78	8.95	1.11
Domestic Ryegrass.....	31.45			
Red Fescue.....	15.53			
Kentucky Bluegrass.....	10.01			
Rough Stalked Meadow Grass.....	10.33			
Red Top.....	16.38			
Prince Edward Island Bent.....	5.46			
<b>THE ALBERT DICKINSON CO., Chicago, Ill.</b>				
C-20	—	1.00	15.10	2.00
	(L.)			
Club Green Mixture.....				
Red Top 26%, Red Fescue 19.2%,				
Kentucky Blue 22%, Ryegrass *14.7%				
Sears, Roebuck & Co., Cambridge.....	(P.)	1.95	14.78	.63
Red Top.....	31.29			
Kentucky Bluegrass.....	23.50			
Domestic Ryegrass.....	13.70			
Red Fescue.....	14.15			

C-49	THOMAS W. EMERSON CO., Boston, Mass.				
	Emerson's Gem Lawn Seed.....	(L.)	—	.40	8.50
	Chewings Red Fescue, Red Top, Kentucky Blue, Timothy, German Bent, White Clover*				
	Maschin & Kratochvil, Springfield.				
	Agrostis spp. (Red Top and German Bent).	(F.)	91.19	.66	7.88
C-33	Timothy.....				
	Chewings Fescue.....				
	White Clover.....				
	Kentucky Bluegrass.....				
	Lawn Seed.....	(L.)	—	.80	20.60
C-3	Red Top, Kentucky Blue, Timothy, Chewings Red Fescue, White Clover				
	C. E. Bragdon, Danvers.....				
	Red Top.....	(F.)	90.15	.54	8.72
	Timothy.....				
	Domestic Ryegrass.....				
C-6	Kentucky Bluegrass.....				
	White Clover.....				
	Red Fescue.....				
	Emerson's Special Mixed Lawn Seed.....	(L.)	—	.50	4.30
	Red Top, Kentucky Blue, Chewings Fescue, White Clover, German Bent				
C-6	Chas. T. Eastman, Falmouth.....				
	Agrostis spp. (Red Top and German Bent).	(F.)	91.49	.36	7.90
	Kentucky Bluegrass.....				
	Chewings Fescue.....				
	White Clover.....				
C-6	Special Mixed Lawn Seed.....	(L.)	—	.50	4.30
	Red Top, Kentucky Bluegrass, Chewings Fescue, White Clover*, German Bent				
	Harvey A. Woods, Groton.....				
	Agrostis spp. (Red Top and German Bent).	(F.)	91.17	.74	7.93
	Kentucky Bluegrass.....				
C-25	Chewings Fescue.....				
	White Clover.....				
	Special Mixed Lawn Seed.....	(L.)	—	.50	4.30
	Red Top, Kentucky Bluegrass, Chewings Fescue, White Clover, German Bent				
	G. C. Winter Co., Southbridge.....	(F.)	87.22	.76	11.83
C-25	Agrostis spp. (Red Top and German Bent).				
	Kentucky Bluegrass.....				
	White Clover.....				
	Chewings Fescue.....				
	White Clover.....				

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## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES—Continued</b>					
C-46	GARFIELD WILLIAMSON CO., New York, N. Y. Lawn Grass Mixture.....(L. Red Top, Kentucky Bluegrass, Timothy, Domestic Ryegrass F. H. Turner & Co., Gt. Barrington.....(F. Timothy.....36.09 Domestic Ryegrass.....23.29 Red Top.....15.46 Kentucky Bluegrass.....5.71	—	1.00	19.00	—
		80.55	.74	17.61	1.10
C-48	J. OLIVER JOHNSON CO., Chicago, Ill. Mixed Lawn Grass Seed.....(L. Red Top 5%, Perennial Ryegrass 30%, Timothy 34%, White Clover 1% Auburn Hardware Co., Springfield.....(F. Domestic Ryegrass.....38.83 Timothy.....28.03 Red Top.....6.46 White Clover......64	—	1.00	29.00	—
		73.96	.95	24.09	1.00
C-22	Grass Mixture.....(L. Red Top, Timothy, Perennial Ryegrass, White Clover* George Hurwitz Hardware Co., Medford.....(F. Red Top.....16.22 Timothy.....21.39 Domestic Ryegrass.....35.20 White Clover.....1.39	—	1.00	29.00	—
		74.20	.78	24.00	1.02
C-10	Winner Brand Lawn Mixture.....(L. (Ingredients not named) Consolidated Nurseries & Seed Co., Boston.....(F. Timothy.....31.31 Domestic Ryegrass.....26.50 Red Top.....13.66 White Clover.....2.35	—	*	*	—
		73.82	2.76	22.95	.47
C-24	D. LANDRETH SEED CO., Bristol, Pa. Fairmount Park Lawn Seed.....(L. (No information available)	—	*	*	—



C-18	O. M. Kindler, Webster					
	Red Top	(F,	76.22	.77	22.14	.87
	Timothy		33.52			
	Kentucky Bluegrass		16.16			
	Domestic Ryegrass		11.33			
	White Clover		11.14			
			4.07			
NORTHROP, KING & CO., Minneapolis, Minn.						
C-18	Velvet Green Lawn Grass	(L,	-	1.00	27.80	-
	Domestic Ryegrass 17.20%, Red Top 15.50%, Timothy 17.35%, Kentucky Blue 9.60%, White Clover 1.55%					
	F. W. Woolworth Co., Boston	(F,	72.00	.86	26.90	.24
	Timothy		24.67			
	Domestic Ryegrass		21.65			
	Kentucky Bluegrass		9.71			
	Red Top		13.94			
	White Clover		2.03			
PAGE SEED CO., Greene, N. Y.						
C-7	Page's Special Lawn Grass, Lot No. L14430	(L,	76.99	2.38	19.75	.46
	Red Top, Timothy, English Perennial Ryegrass, Canada Bluegrass, White Clover 2.75%					
	H. P. Chamberlain Hardware Co., Orange	(F,	71.61	3.07	24.80	.52
	Timothy		26.30			
	Red Top		19.13			
	English Ryegrass		15.12			
	Canada Bluegrass		8.56			
	White Clover		2.50			
ROSS BROS. CO., Worcester, Mass.						
C-23	Worcester Mixture Lawn Seed	(L,	-	*	*	-
	(No information)					
	Brown Bros., Northbridge	(F,	85.75	1.02	13.23	Trace
	Agrostis spp. (Red Top and German Bent)		30.06			
	Domestic Ryegrass		20.35			
	Kentucky Bluegrass		17.64			
	Timothy		10.61			
	Red Fescue		5.09			
	White Clover		2.00			

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## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES—Continued</b>					
<b>ROSS BROS. CO., Continued</b>					
C-26	Worcester Lawn Seed. (Ingredients not named)	88.60	.20	9.40	—
	H. I. Goodsell, Petersham.	(L.			
	Domestic Ryegrass.	29.73			
	Agrostis spp. (Red Top and German Bent)	23.81			
	Kentucky Bluegrass.	20.20			
	Timothy.	6.53			
	Red Fescue.	5.59			
	White Clover.	1.00			Trace
<b>SEED-TOWN PRODUCTS, INC., Chicago, Ill.</b>					
C-12	Lawn Grass Mixture.	—	.29	4.78	.11
	Kentucky Blue 60%, Rye Grass* 9.56%.	(L.			
	Red Top 20.89%, White Clover 4.37%				
	Houghton & Dutton Co., Boston.	(F.			
	Kentucky Bluegrass.	82.66	1.24	15.54	.56
	Red Top.	46.86			
	Domestic Ryegrass.	21.61			
	White Clover.	9.80			
		4.39			
C-17	Seedtown Lawn Grass Mixture.	—	.29	4.78	.11
	Kentucky Blue 66.9% (4), Rye Grass* 9.56%.	(L.			
	Red Top 20.89%, White Clover 4.37%				
	Jordan Marsh Co., Boston.	(F.			
	Kentucky Bluegrass.	83.91	.87	14.81	.41
	Red Top.	46.84			
	Domestic Ryegrass.	21.60			
	White Clover.	10.26			
		5.21			
<b>STANFORD SEED CO., Buffalo, N. Y.</b>					
C-11	City Lawn Seed Mixture.	—	1.00	10.00	—
	White Clover, Fancy Red Top, Fancy	(L.			
	Kentucky Bluegrass, Timothy				
	Osborne Hardware Co., Holyoke.	(F.			
	Red Top.	80.05	2.02	14.09	3.84
	Timothy.	31.82			
	Kentucky Bluegrass.	26.54			
	White Clover.	14.11			
		7.58			

C-21	STUMPP & WALTER CO., New York, N. Y.				
	Greenwood Formula Mixture.....	(L.)		.49	18.50
	Kentucky Bluegrass, Canada Bluegrass, Fancy Red Top, Domestic Ryegrass				
	Faneuil Hall Nursery Co., Boston.....		76.57	.60	22.30
	Domestic Ryegrass.....	(F.)			.53
	Canada Bluegrass.....		29.28		
	Kentucky Bluegrass.....		13.06		
	Red Top.....		7.59		
	Timothy.....		24.23		
	Timothy.....		2.41		
C-27	SUPPLE BIDDLE HARDWARE CO., Philadelphia, Pa.				
	Valley Green Lawn Seed.....	(L.)		*	*
	(No information available)				
	J. F. Robinson Co., Ware.....	(F.)	86.91	.81	11.92
	Red Top.....				.36
	Timothy.....		32.83		
	Kentucky Bluegrass.....		26.71		
	Domestic Ryegrass.....		11.45		
	White Clover.....		8.51		
	White Clover.....		7.41		
C-8	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.				
	City Park Special Mixture.....	(L.)		1.5	17.5
	Red Top, Canada Bluegrass, Domestic Ryegrass, Timothy, White Clover 3%				3.00
	Wilson Hardware Co., Holyoke.....	(F.)	71.01	1.55	26.30
	Red Top.....				1.14
	Timothy.....		30.95		
	Domestic Ryegrass.....		22.59		
	Canada Bluegrass.....		13.04		
	White Clover.....		10.38		
	White Clover.....		4.05		
C-9	Excelsior Special Mixture.....	(L.)		1.00	12.00
	Red Top, Kentucky Bluegrass, Canada Bluegrass, Timothy, White Clover, Chewings Fescue				2.00
	Wilson Hardware Co., Holyoke.....	(F.)	82.99	.94	15.44
	Red Top.....				.63
	Kentucky Bluegrass.....		42.01		
	Canada Bluegrass.....		10.03		
	Timothy.....		8.70		
	White Clover.....		9.71		
	White Clover.....		7.47		
	Chewings Fescue.....		5.07		

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(4) Label incorrect; total percentages exceed 100.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES—Continued</b>					
C-4	WHITNEY-ECKSTEIN SEED CO., Continued				
	Lawn Grass Mixture.....	—	1.00	12.00	2.00
	Red Top, Kentucky Bluegrass, Canada Bluegrass, Timothy, White Clover, Chewings Fescue*	(L.,			
	The Fiske Corporation, Natick.....	(F.,			
	Red Top.....	41.51	.65	18.05	.38
	Timothy.....	13.38			
	Kentucky Bluegrass.....	8.13			
	Canada Bluegrass.....	8.03			
	White Clover.....	7.65			
	Chewings Fescue.....	2.22			
C-1	Pan-American Lawn Seed.....	(L.,	1.00	16.00	2.00
	Red Top, Kentucky Blue, Canada Blue, Domestic Ryegrass, Timothy, White Clover	(F.,			
	Franklin D. Williams, Taunton.....	26.18	2.89	19.01	.38
	Red Top.....	16.32			
	Timothy.....	15.78			
	Domestic Ryegrass.....	5.51			
	White Clover.....	8.80			
	Kentucky Bluegrass.....	5.13			
	Canada Bluegrass.....				
	Sylvan Shady Spot.....	(L.,	1.00	12.00	2.00
C-2	Kentucky Bluegrass, Canada Bluegrass* Fancy Red Top, English Ryegrass, Hard Fescue, Timothy, R. S. Meadow, Crested Dog's-tail	(F.,			
	Pierce Hardware Co., Taunton.....	24.55	.96	10.20	2.56
	Domestic Ryegrass.....	15.63			
	Red Top.....	14.22			
	Timothy.....	7.70			
	Rough Stalked Meadow Grass.....	6.60			
	Kentucky Bluegrass.....	4.75			
	Canada Bluegrass.....	7.00			
	Hard Fescue.....	5.83			
	Crested Dog's-tail.....				
C-36	F. H. WOODRUFF & SONS, Milford, Conn. Lawn Seed.....	(L.,	.89	15.71	—
	Kentucky Blue, Red Top, White Clover, Meadow Fescue, Timothy, Dom. Ryegrass				

C-13	M. W. Dugan Co., Newburyport.....	(F.)	83.98	1.26	14.44	.32
	Red Top.....					
	Kentucky Bluegrass.....		28.35			
	Timothy.....		16.44			
	Meadow Fescue.....		13.16			
S. D. WOODRUFF & SONS, Orange, Conn.	Domestic Ryegrass.....		9.56			
	White Clover.....		9.39			
	White Clover.....		7.08			
	Velvet Green Lawn Grass Mixture.....	(L.)	-	3.00	20.00	-
	Dom. Ryegrass, Red Top, Kentucky Blue*, Timothy A. G. Patch, Boston.....	(F.)	66.90	1.72	24.66	6.72
C-19	Domestic Ryegrass.....		30.85			
	Timothy.....		19.97			
	Red Top.....		11.28			
	Kentucky Bluegrass.....		4.80			
	WHOLESALE NOT GIVEN					
C-39	Green Cover Grass Seed Mixture.....	(L.)	-	1.50	23.50	-
	Red Top 14%, Rye Grass* 32%, and Timothy 29% Sears, Roebuck & Co., Cambridge Timothy.....	(F.)	76.43	1.20	21.57	.80
	Domestic Ryegrass.....		46.70			
	Red Top.....		21.26			
	Red Top.....		8.47			
C-39	City Park Lawn Seed.....	(L.)	-	1.50	17.50	3.00
	Redtop, Canada Bluegrass, Timothy, White Clover 3% Wilson's Hardware Co., Newburyport.....	(F.)	72.03	2.01	24.10	1.86
	Domestic Ryegrass.....		27.06			
	Timothy.....		18.61			
	Red Top.....		15.81			
C-42	Canada Bluegrass.....		7.53			
	White Clover.....		3.02			
	Lawn Grass.....	(L.)	-	1.00	14.00	-
	Domestic Ryegrass, Timothy, Red Top 2%, White Clover New England Sales Co., Mansfield.....	(F.)	80.87	1.54	17.01	.58
	Domestic Ryegrass.....		44.09			
C-42	Timothy.....		35.27			
	Red Top.....		1.51			

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## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>ASPARAGUS</b>			
D-241	D. LANDRETH SEED CO., Bristol, Pa. Mary Washington Asparagus..... Hampshire Hardware Co., Northampton	60	June
<b>BEANS</b>			
D-31	JOSEPH BRECK & SONS CORP., Boston, Mass. Improved Golden Wax Bush Beans..... Williams Bros., Osterville	85	June
D-227	THOMAS W. EMERSON CO., Boston, Mass. Dwarf Horticultural Beans..... L. Richmond & Co., Brockton	88	June
D-75	Golden Wax Beans..... C. K. Wanamaker, Arlington	78	June
D-218	Improved Golden Wax Beans..... W. F. Flynn & Son, Attleboro	81	June
D-98	Pole Horticultural Beans..... G. C. Winter Co., Southbridge	87	June
D-29	Pole Lima Beans (Burpee's)..... T. W. Pierce, Middleboro	84	June
D-134	D. M. FERRY & CO., Detroit, Mich. Kentucky Wonder Pole Beans..... J. J. Tebo, Grafton	92	June
D-220	J. J. H. GREGORY & SON, Marblehead, Mass. Kentucky Wonder Pole Beans..... B. F. Hill Hardware, Salem	93	June
D-264	CHAS. C. HART SEED CO., Wethersfield, Conn. Improved Golden Wax Beans..... F. H. Turner Co., Gt. Barrington	88	June
D-230	Kentucky Wonder Beans..... J. Rubinstein, Beverly	95	June
D-302	D. LANDRETH SEED CO., Bristol, Pa. Horticultural Pole Beans..... W. E. Aubuchon Co., Clinton	98	June
D-50	LEONARD SEED CO., Chicago, Ill. Burpee's Improved Kidney Wax Beans..... A. E. Stewart, Athol	89	June
D-233	Burpee's Stringless Green Pod Beans..... Wilson's Hardware, Newburyport	89	June
D-28	Burpee's Stringless Green Pod Dwarf Early Beans..... Franklin D. Williams, Taunton	81	June
D-248	JEROME B. RICE SEED CO., Cambridge, N. Y. Improved Rustless Golden Wax Beans..... Frank Howard, Pittsfield	72	June
D-49	Kentucky Wonder Pole Beans..... I. G. Dwinell, Ayer	93	June
D-73	Pencil Pod Black Wax Beans..... Wells Hardware Co., Holyoke	96	June
D-60	Rice's Carmine Poddled Horticultural Dwarf Beans..... Wells Hardware Co., Holyoke	90	June
D-132	ROSS BROS. CO., Worcester, Mass. Black Wax Beans..... C. F. Wheeler, West Brookfield	88	June
D-293	Dwarf Horticultural Beans..... Hamilton Hardware Co., Clinton	98	June

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>BEANS—Continued</b>			
D-93	ROSS BROS. CO., Continued Golden Wax Beans..... Casey Auto Supply Co., Milford	86	June
D-115	Horticultural Pole Beans*..... S. J. Simenson Co., Barre	78	June
D-116	Kentucky Wonder Wax Beans..... S. J. Simenson Co., Barre	73	June
D-294	Kentucky Wonder Yellow Pod Beans..... Hamilton Hardware Co., Clinton	96	June
D-219	F. H. WOODRUFF & SONS, Milford, Conn. Yellow, Six Weeks Beans..... Martin Hardware Co., No. Attleboro	91	June
D-298	S. D. WOODRUFF & SONS, Orange, Conn. French Horticultural Beans..... White Hardware Co., Framingham	96	June
D-58	Imperial Golden Wax Beans..... Holyoke Farm Machinery Co., Holyoke	82	June
D-54	Wax Beans (Variety illegible)..... E. M. Gould, Shelburne Falls	87	June
D-79	WHOLESALE NOT GIVEN Kentucky Wonder Wax Beans..... Clebnik Bros., Malden	98	June
D-107	WHOLESALE UNKNOWN Golden Wax Beans..... Waite Hardware, Southbridge	60	June
<b>BEETS</b>			
D-213	JOSEPH BRECK & SONS CORP., Boston, Mass. Dewings Early Blood Beet..... Pentucket Hardware, Haverhill	83	June
D-140	THOMAS W. EMERSON CO., Boston, Mass. Detroit Dark Red Beet..... E. T. Hall, West Upton	65	June
D-186	Detroit Dark Red Beet..... C. E. Bragdon, Danvers	70	June
D-306	Dewing's Improved Beet..... VanDuzer Hardware Co., Framingham	76	June
D-152	Eclipse Beet..... W. F. Flynn & Son, Attleboro	62	June
D-128	Edmand's Early Blood Beet..... Ryther & Warren, Belchertown	72	June
D-110	D. M. FERRY & CO., Detroit, Mich. Crosby's Egyptian Beet..... H. I. Goodsell, Petersham	62	May
D-105	CHAS. C. HART SEED CO., Wethersfield, Conn. Crosby's Egyptian Beet..... Waite Hardware, Southbridge	73	May
D-208	LEONARD SEED CO., Chicago, Ill. Crimson Globe Beet..... Wilson's Hardware, Newburyport	60	June
D-215	Crosby's Egyptian Beet..... Schofield Hardware Co., No. Attleboro	65	June
D-36	Detroit Dark Red Beet..... A. E. Stewart, Athol	63	May
D-177	Detroit Dark Red Turnip Beet..... A. I. Task, Brockton	66	June

\*1929 seed.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>BEETS—Continued</b>			
D-114	NORTHRUP, KING & CO., Minneapolis, Minn. Detroit Dark Red Beet..... Fred B. Holland, Barre Plains	72	Dec.
D-252	JEROME B. RICE SEED CO., Cambridge, N. Y. Boston Crosby Beet..... Frank Howard, Pittsfield	66	July
D-20	Crosby's Dark Red Egyptian Turnip Beet..... The Fiske Corporation, Natick	65	June
D-268	Detroit Dark Red Beet..... S. Allen's Sons, Greenfield	60	June
D-290	Detroit Dark Red Beet..... W. E. Aubuchon Co., Clinton	65	June
D-253	Detroit Dark Red Turnip Beet..... Frank Howard, Pittsfield	71	June
D-90	ROSS BROS. CO., Worcester, Mass. Detroit Dark Red Beet..... O. M. Kindler, Webster	65	May
D-295	Detroit Dark Red Beet..... Hamilton Hardware Co., Clinton	63	July
D-118	Early Blood Turnip Beet..... S. J. Simenson Co., Barre	67	June
D-262	F. H. WOODRUFF & SONS, Milford, Conn. Crosby's Egyptian Beet..... Platt & Goslee, Gt. Barrington	84	July
D-6	Early Eclipse Beet..... Waldron Hardware Co., Taunton	58	June
D-63	S. D. WOODRUFF & SONS, Orange, Conn. Early Wonder Beet**..... Holyoke Farm Machinery Co., Holyoke	60	June
<b>BROCCOLI</b>			
D-222	CHAS. C. HART SEED CO., Wethersfield, Conn. It. Early Green Calabrese Broccoli**..... L. D. Winer Hardware, Salem	65	July
<b>BRUSSELS SPROUTS</b>			
D-167	JEROME B. RICE SEED CO., Cambridge, N. Y. Brussels Sprouts**..... C. A. Noyes Co., Brockton	33	July
<b>CABBAGE</b>			
D-161	JOSEPH BRECK & SONS CORP., Boston, Mass. Drumhead Savoy Cabbage..... B. F. Hill Hardware, Salem	92	June
D-203	THOMAS W. EMERSON CO., Boston, Mass. Danish Ballhead Cabbage..... D. Cashman Hardware, Newburyport	66	June
D-197	Stone Mason Cabbage..... Whitcomb-Carter Co., Beverly	87	June
D-11	FREDONIA SEED CO., Fredonia, N. Y. Danish Ball Head Cabbage**..... Marsden Bros., Middleboro	72	Dec.
D-87	Early Savoy Cabbage**..... A. DeCelles, Webster	64	July

\*\* Retested.



## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>CABBAGE—Continued</b>			
D-143	BUDD D. HAWKINS, Reading, Vt. Hollander Cabbage..... Arthur Anderson, Sterling	93	June
D-43	D. LANDRETH SEED CO., Bristol, Pa. Danish Round Head Cabbage..... H. Newell & Co., Shelburne Falls	84	June
D-242	Early Jersey Wakefield Cabbage..... Hampshire Hardware Co., Northampton	87	June
D-146	LEONARD SEED CO., Chicago, Ill. Drumhead Savoy Cabbage..... Schofield Hardware, No. Attleboro	64	June
D-4	JEROME B. RICE SEED CO., Cambridge, N. Y. Drumhead Savoy Cabbage..... Pierce Hardware Co., Taunton	92	June
D-280	Genuine Surehead Cabbage**..... Arthur C. Lamson, Marlboro	60	July
D-257	Premium Flat Dutch Cabbage**..... Pierson Hardware Co., Pittsfield	45	July
D-238	F. H. WOODRUFF & SONS, Milford, Conn. Jersey Wakefield Cabbage..... Spanias Hardware, Haverhill	67	June
D-182	S. D. WOODRUFF & SONS, Orange, Conn. All Season Cabbage**..... Danvers Hardware Co., Danvers	38	July
<b>CANTALOUPE</b>			
D-275	F. H. WOODRUFF & SONS, Milford, Conn. Emerald Green Cantaloupe..... F. I. Webster Co., Greenfield	65	June
<b>CARROT</b>			
D-57	EVERETT B. CLARK SEED CO., Milford, Conn. (1) Danvers Half Long Carrot**..... Consolidated Nurseries & Seed Co., Boston	48	May
D-102	THOMAS W. EMERSON CO., Boston, Mass. Danvers Half Long Carrot..... G. C. Winter Co., Southbridge	65	May
D-162	Danvers Half Long Carrot..... Waters & Brown Hardware, Salem	57	June
D-193	Danvers Half Long Carrot..... Whitcomb-Carter Co., Beverly	57	June
D-305	Danvers Half Long Carrot..... VanDuzer Hardware Co., Framingham	82	June
D-174	Long Orange Carrot**..... L. Richmond Co., Brockton	50	June
D-14	LAKE SHORE SEED CO., Dunkirk, N. Y. Danvers Half Long Carrot**..... H. G. Cox, Barnstable	38	May
D-45	D. LANDRETH SEED CO., Bristol, Pa. Danvers Long Carrot**..... H. Newell & Co., Shelburne Falls	54	June
D-207	LEONARD SEED CO., Chicago, Ill. Danvers Carrot..... Wilson's Hardware, Newburyport	61	June
D-37	Ox Heart Carrot**..... H. P. Chamberlain Hardware, Orange	15	May

\*\*Retested. (1) Concern out of existence.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>CARROT—Continued</b>			
D-250	JEROME B. RICE SEED CO., Cambridge, N. Y. Coreless Carrot..... Frank Howard, Pittsfield	48	July
D-273	Danvers Half Long Carrot**..... Newcomb Hardware Co., Greenfield	54	July
D-123	Improved Long Orange Carrot..... H. R. Durant, Belchertown	58	June
D-121	ROSS BROS. CO., Worcester, Mass. Danvers Half Long Carrot**..... S. J. Simenson Co., Barre	57	June
D-91	True Danvers Half Long Carrot**..... Brown Bros., Northbridge	52	June
D-5	F. H. WOODRUFF & SONS, Milford, Conn. Danvers Half Long Carrot**..... Waldron Hardware Co., Taunton	43	June
D-147	Danvers Half Long Carrot..... W. M. Hall Co., No. Attleboro	57	June
D-234	Improved Long Orange Carrot..... Spanias Hardware, Haverhill	71	June
D-69	S. D. WOODRUFF & SONS, Orange, Conn. Danvers Half Long Carrot**..... Holyoke Farm Machinery Co., Holyoke	61	June
D-181	Hutchinson Carrot..... Danvers Hardware Co., Danvers	73	June
D-21	WHOLESALE UNKNOWN Danvers Half Long Carrot..... Peboco Hardware, Wellesley	62	May
<b>CAULIFLOWER</b>			
D-156	THOMAS W. EMERSON CO., Boston, Mass. Snowball Cauliflower**..... W. C. Fuller Co., Mansfield	66	July
D-173	FERRY-MORSE CO., Detroit, Mich. Early Snowball Cauliflower..... A. C. Stone Hardware, Brockton	66	June
D-81	PAGE SEED CO., Greene, N. Y. Early Favorite Cauliflower..... J. P. Connolly Co., Milford	72	June
<b>CELERY</b>			
D-163	THOMAS W. EMERSON CO., Boston, Mass. Self Blanching Golden Celery**..... Waters & Brown, Salem	0	June
D-188	D. M. FERRY & CO., Detroit, Mich. Savoy Celery..... C. E. Bragdon, Danvers..	42	June
D-127	LEONARD SEED CO., Chicago, Ill. Boston Market Celery**..... J. B. Sibley & Son, Ware	42	June
D-169	JEROME B. RICE SEED CO., Cambridge, N. Y. White Plume Celery..... C. A. Noyes Co., Brockton	60	June
D-206	F. H. WOODRUFF & SONS, Milford, Conn. Boston Market Celery**..... M. W. Dugan Co., Newburyport	37	June

\*\*Retested.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>SWEET CORN</b>			
D-229	JOSEPH BRECK & SONS CORP., Boston, Mass. Golden Orange Corn..... Morse Hardware Co., Danvers	84	June
D-76	THOMAS W. EMERSON CO., Boston, Mass. Golden Bantam Corn..... C. K. Wanamaker, Arlington	86	May
D-97	Golden Bantam Corn..... Uxbridge Hardware Co., Uxbridge	78	May
D-47	Golden Bantam Sweet Corn..... Harvey A. Woods Hardware Co., Groton	85	May *
D-239	Golden Orange Corn..... Villeneuve Hardware, Haverhill	90	June
D-124	Sweet Early Golden Sunrise Corn..... Ryther & Warren, Belchertown	79	June
D-138	D. M. FERRY & CO., Detroit, Mich. Golden Bantam Corn..... J. J. Tebo, Grafton	80	June
D-224	CHAS. C. HART SEED CO., Wethersfield, Conn. Golden Bantam Corn..... J. Rubenstein, Beverly	94	June
D-106	Stowell's Evergreen Corn..... Waite Hardware, Southbridge	75	May
D-216	LEONARD SEED CO., Chicago, Ill. Black Mexican Sweet Corn**..... W. M. Hall Co., No. Attleboro	54	June
D-26	Golden Bantam, Golden Grain, Early Sweet Corn..... Franklin D. Williams Hardware, Taunton	94	May
D-228	Golden Sunshine Sweet Corn..... A. I. Trask, Brockton	79	June
D-53	White Cob Corn..... Burnap Bros., Shelburne Falls	93	May
D-142	PAGE SEED CO., Greene, N. Y. Golden Bantam Corn..... Harlow Bros., Sterling	88	June
D-245	JEROME B. RICE SEED CO., Cambridge, N. Y. Golden Bantam Corn..... Frank Howard, Pittsfield	86	June
D-32	Potter's Excelsior Sweet Corn..... G. E. Doane, Middleboro	92	May
D-117	ROSS BROS. CO., Worcester, Mass. Golden Giant Sweet Corn..... S. J. Simenson Co., Barre	95	June
D-112	F. H. WOODRUFF & SONS, Milford, Conn. Golden Bantam Corn..... Fred B. Holland, Barre Plains	83	June
D-263	Golden Bantam Sweet Corn..... Platt & Goslee, Gt. Barrington	75	June
D-72	S. D. WOODRUFF & SONS, Orange, Conn. Golden Bantam Corn..... Holyoke Farm Machinery Co., Holyoke	94	May
D-74	Whipple's Early Corn..... Holyoke Farm Machinery Co., Holyoke	95	May
D-299	Whipple's Yellow Corn..... White Hardware Co., Framingham	98	July

\*\* Retested

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>SWEET CORN—Continued</b>			
D-77	PILL BROS. (1) Corn (Unnamed)..... Coggan & Sherman, Malden	72	May
D-55	A. COPE, Shelburne Falls, Mass. (Local Farmer) Corn (Variety not named)..... E. M. Gould, Shelburne Falls	95	May
D-113	WHOLESALE UNKNOWN *Crosby's Early Sweet Corn**..... Fred B. Holland, Barre Plains	36	June
<b>CRESS</b>			
D-171	JEROME B. RICE SEED CO., Cambridge, N. Y. Curled Cress**..... C. A. Noyes Co., Brockton	25	June
<b>CUCUMBER</b>			
D-22	JOSEPH BRECK & SONS CORP., Boston, Mass. Improved Long Green Cucumber..... Peboco Hardware, Wellesley	90	June
D-191	Improved Long Green Cucumber..... Morse Hardware, Danvers	89	June
D-175	THOMAS W. EMERSON CO., Boston, Mass. Arlington White Spine Cucumber..... L. Richmond Co., Brockton	82	June
D-1	Early White Spine Cucumber..... Cobb, Bates & Yerxa Co., Taunton	82	June
D-160	Japanese Climbing Cucumber..... Murphy Hardware, Salem	50	June
D-101	White Spine Cucumber..... G. C. Winter Co., Southbridge	84	June
D-122	D. M. FERRY & CO., Detroit, Mich. Improved Long Green Cucumber..... H. R. Durant, Belchertown	72	June
D-136	CHAS. C. HART SEED CO., Wethersfield, Conn. Improved White Spine Cucumber..... J. J. Tebo, Grafton	97	June
D-89	D. LANDRETH SEED CO., Bristol, Pa. Improved Long Green Cucumber..... O. M. Kindler, Webster	95	June
D-244	Improved Long Green Cucumber..... Hampshire Hardware Co., Northampton	93	June
D-144	LEONARD SEED CO., Chicago, Ill. Early Cluster Cucumber..... Schofield Hardware, No. Attleboro	92	June
D-38	Early White Spine Cucumber..... H. P. Chamberlain Hardware, Orange	87	June
D-210	JEROME B. RICE SEED CO., Cambridge, N. Y. Improved Long Green Cucumber..... Treat Hardware Corp., Lawrence	79	June
D-258	White Spine Cucumber..... Pierson Hardware Co., Pittsfield	75	June
D-292	White Spine Cucumber..... W. E. Aubuchon Co., Clinton	90	June
D-205	F. H. WOODRUFF & SONS, Milford, Conn. Hybrid Cucumber..... M. W. Dugan Co., Newburyport	93	June

\*1929 seed. \*\*Retested. (1) Concern out of existence.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>CUCUMBER—Continued</b>			
D-235	F. H. WOODRUFF & SONS, Continued White Spine Cucumber..... Spanias Hardware, Haverhill	82	June
D-66	S. D. WOODRUFF & SONS, Orange, Conn. Boston Pickling Cucumber..... Holyoke Farm Machinery Co., Holyoke	95	June
D-67	Long Green Cucumber..... Holyoke Farm Machinery Co., Holyoke	90	June
D-300	White Spine Cucumber..... White Hardware Co., Framingham	87	June
<b>DILL</b>			
D-65	S. D. WOODRUFF & SONS, Orange, Conn. Dill (Variety not named)**..... Holyoke Farm Machinery Co., Holyoke	41	June
<b>ENDIVE</b>			
D-289	BUDD D. HAWKINS, Reading, Vt. Green Curled or Giant Fringed Oyster Endive..... Arthur C. Lamson, Marlboro	76	June
D-277	F. H. WOODRUFF & SONS, Milford, Conn. Broad Leaf Batavia Endive..... F. I. Webster Co., Greenfield	67	June
<b>KALE</b>			
D-168	JEROME B. RICE SEED CO., Cambridge, N. Y. Dwarf Scotch Green Curled Kale**..... C. A. Noyes, Brockton	48	July
<b>KOHL RABI</b>			
D-185	NORTHROP, KING & CO., Minneapolis, Minn. Early White Kohl Rabi**..... Danvers Hardware Co., Danvers	67	June
<b>LETTUCE</b>			
D-56	EVERETT B. CLARK SEED CO., Milford, Conn. (1) Iceberg Lettuce (Stock #J. 953, 1928)**..... Consolidated Nurseries & Seed Co., Boston	0	June
D-158	THOMAS W. EMERSON CO., Boston, Mass. Black Seed Tennis Ball Lettuce..... Murphy Hardware Co., Salem	95	June
D-176	Iceberg Lettuce..... L. Richmond Co., Brockton	91	June
D-202	Iceberg Lettuce**..... D. Cashman Hardware, Newburyport	52	June
D-303	Iceberg Lettuce..... VanDuzer Hardware Co., Framingham	89	June
D-195	White Cos Lettuce**..... Whitcomb-Carter Co., Beverly	0	June
D-104	D. M. FERRY & CO., Detroit, Mich. Big Boston Lettuce..... Yankee Shop, Southbridge	71	June
D-23	CHAS. C. HART SEED CO., Wethersfield, Conn. Big Boston Head Lettuce..... Peboco Hardware Co., Wellesley	60	June
D-34	Hanson Lettuce..... C. F. Paige Hardware Co., Athol	96	June

\*\*Retested. (1) Concern out of existenc.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>LETTUCE—Continued</b>			
D-287	BUDD D. HAWKINS, Reading, Vt. Improved Hanson Lettuce..... Arthur C. Lamson, Marlboro	82	June
D-42	D. LANDRETH SEED CO., Bristol, Pa. Iceberg Lettuce..... H. Newell & Co., Shelburne Falls	93	June
D-125	LEONARD SEED CO., Chicago, Ill. Big Boston Lettuce..... J. B. Sibley & Son, Ware	80	June
D-145	Iceberg Lettuce**..... Schofield Hardware Co., No. Attleboro	1	June
D-266	JEROME B. RICE SEED CO., Cambridge, N. Y. Big Boston Lettuce..... Frank Howard, Pittsfield	70	June
D-291	Big Boston Lettuce..... W. E. Aubuchon Co., Clinton	48	June
D-3	Boston Curled Lettuce..... Pierce Hardware Co., Taunton	74	June
D-211	Black Seed Tennis Ball Lettuce..... Treat Hardware Corp., Lawrence	82	June
D-274	Tennis Ball Lettuce**..... Newcomb Hardware Co., Greenfield	1	June
D-278	F. H. WOODRUFF & SONS, Milford, Conn. California Cream Butter Lettuce..... F. I. Webster Co., Greenfield	62	June
D-236	Romaine Lettuce..... Spanias Hardware Co., Haverhill	87	June
<b>MUSKMELON</b>			
D-150	THOMAS W. EMERSON CO., Boston, Mass. Miller Cream Muskmelon..... W. F. Flynn & Son, Attleboro	75	June
D-286	BUDD D. HAWKINS, Reading, Vt. Famous Rocky Ford Muskmelon..... Arthur C. Lamson, Marlboro	50	June
D-190	LAKE SHORE SEED CO., Dunkirk, N. Y. Netted Gem Muskmelon..... Morse Hardware Co., Danvers	44	June
D-7	JEROME B. RICE SEED CO., Cambridge, N. Y. Extra Early Hackensack Muskmelon..... G. E. Doane, Middleboro	89	June
<b>ONION</b>			
D-240	COMSTOCK, FERRE & CO., Wethersfield, Conn. Southport Yellow Globe Onion**..... Foster-Farrar Co., Northampton	78	June
D-304	THOMAS W. EMERSON CO., Boston, Mass. Yellow Globe Danvers Onion..... VanDuzer Hardware Co., Framingham	53	July
D-282	JEROME B. RICE SEED CO., Cambridge, N. Y. Yellow Globe Danvers Onion**..... Arthur C. Lamson, Marlboro	48	June
D-254	Yellow Globe Onion..... Pierson Hardware Co., Pittsfield	84	June

\*\* Retested.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>PARSLEY</b>			
D-157	THOMAS W. EMERSON CO., Boston, Mass. Double Curled Parsley**..... Murphy Hardware Co., Salem	6	June
D-153	Moss Curled Parsley..... W. C. Fuller Co., Mansfield	73	June
D-172	FERRY-MORSE CO., Detroit, Mich. Plain Parsley..... A. C. Stone Hardware Co., Brockton	72	June
D-187	CHAS. C. HART SEED CO., Wethersfield, Conn. Italian Parsley..... C. E. Bragdon, Danvers	75	June
D-24	Italian or Plain Leaf Parsley..... Peboco Hardware, Wellesley	78	June
D-284	Moss Curled Parsley..... Arthur C. Lamson, Marlboro	74	June
D-80	PAGE SEED CO., Greene, N. Y. Moss Curled Parsley**..... J. P. Connolly Co., Milford	55	June
D-212	JEROME B. RICE SEED CO., Cambridge, N. Y. Champion Moss Curled Parsley..... Treat Hardware Corp., Lawrence	70	June
D-64	S. D. WOODRUFF & SONS, Orange, Conn. Hamburg Parsley**..... Holyoke Farm Machinery Co., Holyoke	65	June
D-255	JEROME B. RICE SEED CO., Cambridge, N. Y. Moss Curled Parsley..... Pierson Hardware Co., Pittsfield	74	July
<b>PARSNIP</b>			
D-12	THOMAS W. EMERSON CO., Boston, Mass. Hollow Crown Parsnip..... Chas. T. Eastman, Falmouth	77	June
D-41	Hollow Crown Parsnip..... Orange Hardware Co., Orange	74	May
D-129	Hollow Crown Parsnip..... Ryther & Warren, Belchertown	53	May
D-199	Hollow Crown Parsnip..... D. Cashman Hardware Co., Newburyport	42	June
D-192	Long Smooth Parsnip..... Whitcomb-Carter Co., Beverly	74	June
D-25	CHAS. C. HART SEED CO., Wethersfield, Conn. Hollow Crown Parsnip..... Peboco Hardware Co., Wellesley	60	May
D-283	Hollow Crown Parsnip..... Arthur C. Lamson, Marlboro	68	June
D-209	JEROME B. RICE SEED CO., Cambridge, N. Y. Hollow Crown Parsnip..... Treat Hardware Co., Lawrence	47	June
D-256	Hollow Crown Parsnip..... Pierson Hardware Co., Pittsfield	47	June
D-271	Hollow Crown Parsnip..... Newcomb Hardware Co., Greenfield	60	June
D-108	WHOLESALE UNKNOWN Hollow Crown Parsnip**..... Waite Hardware Co., Southbridge	51	June

\*\*Retested.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>PEAS</b>			
D-30	W. E. BARRETT CO., Providence, R. I. Dwarf Telephone Peas..... Palmouth Plumbing & Hardware Co., Falmouth	61	May
D-95	THOMAS W. EMERSON CO., Boston, Mass. Laxtonia Peas..... Uxbridge Hardware Co., Uxbridge	91	May
D-48	Nott's Excelsior Peas..... Harvey A. Woods Hardware, Groton	89	May
D-165	Sutton's Excelsior Peas..... Salem Hardware Co., Salem	76	June
D-221	Sutton's Excelsior Peas..... Salem Hardware Co., Salem	69	June
D-139	Telephone Peas..... E. T. Hall, West Upton	45	June
D-135	D. M. FERRY & CO., Detroit, Mich. Thomas Laxton Peas..... J. J. Tebo, Grafton	87	May
D-133	FERRY-MORSE CO., Detroit, Mich. Alderman Peas**..... C. F. Wheeler, West Brookfield	70	June
D-265	CHAS. C. HART SEED CO., Wethersfield, Conn. Dwarf Champion Peas..... F. H. Turner & Co., Gt. Barrington	84	June
D-301	D. LANDRETH SEED CO., Bristol, Pa. Gradus Peas..... W. E. Aubuchon Co., Clinton	89	June
D-27	LEONARD SEED CO., Chicago, Ill. Nott's Excelsior Peas..... Franklin D. Williams, Taunton	97	May
D-52	Telephone Peas..... Burnap Bros., Shelburne Falls	76	May
D-141	PAGE SEED CO., Greene, N. Y. Sutton's Excelsior Peas..... Harlow Bros., Sterling	96	May
D-78	PILL BROS. (1) Nott's Excelsior Peas*..... Coggan & Sherman, Malden	89	May
D-247	JEROME B. RICE SEED CO., Cambridge, N. Y. Gradus Peas..... Frank Howard, Pittsfield	97	June
D-70	Sutton's Excelsior Large Podded Dwarf Peas..... Wells Hardware Co., Holyoke	75	May
D-120	ROSS BROS. CO., Worcester, Mass. Blue Bantam Peas..... S. J. Simenson, Barre	89	June
D-109	Gradus Peas..... H. I. Goodsell, Petersham	93	May
D-232	F. H. WOODRUFF & SONS, Milford, Conn. Laxtonia Peas..... M. W. Dugan Co., Newburyport	72	June
D-231	S. D. WOODRUFF & SONS, Orange, Conn. Tall Telephone Peas..... Winer Bros. Hardware, Beverly	74	June

\* 1929 seed. \*\* Retested. (1) Concern out of existence.



## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>PEPPER</b>			
D-166	JEROME B. RICE SEED CO., Cambridge, N. Y. Neapolitan Pepper**..... C. A. Noyes Co., Brockton	25	July
D-149	F. H. WOODRUFF & SONS, Milford, Conn. Bull Nose Pepper..... Martin's Hardware Co., No. Attleboro	82	June
D-59	S. D. WOODRUFF & SONS, Orange, Conn. Sweet Mountain Pepper**..... Holyoke Farm Machinery Co., Holyoke	34	July
<b>PUMPKIN</b>			
D-217	THOMAS W. EMERSON CO., Boston, Mass. Pumpkin..... W. F. Flynn & Son, Attleboro	88	June
D-10	Sugar Pumpkin..... T. W. Pierce, Middleboro	70	June
<b>RADISH</b>			
D-84	THOMAS W. EMERSON CO., Boston, Mass. French Breakfast Radish**..... Uxbridge Hardware, Uxbridge	70	July
D-164	Long Scarlet Radish**..... Waters & Brown, Salem	17	June
D-151	Scarlet Globe Radish**..... W. F. Flynn & Son, Attleboro	34	June
D-201	Scarlet Globe Radish..... D. Cashman Hardware, Newburyport	60	June
D-2	Scarlet Turnip Radish..... Cobb, Bates & Yerxa, Taunton	70	June
D-137	D. M. FERRY & CO., Detroit, Mich. Long Scarlet Radish..... J. J. Tebo, Grafton	73	June
D-103	CHAS. C. HART SEED CO., Wethersfield, Conn. Early Scarlet Globe Radish**..... Yankee Shop, Southbridge	65	July
D-15	LAKE SHORE SEED CO., Dunkirk, N. Y. Early Red Turnip Radish**..... H. G. Cox, Barnstable	60	July
D-189	French Breakfast Radish**..... Morse Hardware, Danvers	47	June
D-39	LEONARD SEED CO., Chicago, Ill. Early Turnip White Tipped Radish..... H. P. Chamberlain Hardware, Orange	63	June
D-130	White Icicle Radish**..... J. B. Sibley & Son, Ware	55	June
D-178	White Tipped Scarlet Turnip Radish**..... A. I. Task, Brockton	52	July
D-83	PAGE SEED CO., Greene, N. Y. Early Scarlet Turnip Radish..... Casey Auto Supply Co., Milford	82	June
D-270	JEROME B. RICE SEED CO., Cambridge, N. Y. Early Scarlet Radish..... Newcomb Hardware Co., Greenfield	76	June
D-267	Early Scarlet Turnip Radish..... S. Allen's Sons, Greenfield	84	June

\*\* Retested.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>RADISH—Continued</b>			
D-249	JEROME B. RICE SEED CO.,—Continued French Breakfast Radish..... Frank Howard, Pittsfield	88	June
D-61	S. D. WOODRUFF & SONS, Orange, Conn. Scarlet Globe Radish**..... Holyoke Farm Machinery Co., Holyoke	61	July
<b>SALSIFY</b>			
D-44	D. LANDRETH SEED CO., Bristol, Pa. Salsify, Sandwich Island..... H. Newell & Co., Shelburne Falls	62	June
D-279	F. H. WOODRUFF & SONS, Milford, Conn. Mammoth Sandwich Island Salsify..... F. I. Webster Co., Greenfield	61	June
<b>SPINACH</b>			
D-40	THOMAS W. EMERSON CO., Boston, Mass. Round Thick Leaf Spinach..... Orange Hardware Co., Orange	88	June
D-194	Round Thick Leaf Spinach..... Whitcomb-Carter Co., Beverly	77	June
D-200	Victoria Spinach..... D. Cashman Hardware, Newburyport	79	June
D-119	CHAS. C. HART SEED CO., Wethersfield, Conn. Giant Thick Leaf Spinach..... S. J. Simenson Co., Barre	84	June
D-285	BUDD D. HAWKINS, Reading, Vt. American Savoy or Long Standing Spinach..... Arthur C. Lamson, Marlboro	70	June
D-179	LEONARD SEED CO., Chicago, Ill. Savoy Leafed Bloomsdale Spinach**..... A. I. Task, Brockton	20	June
D-251	JEROME B. RICE SEED CO., Cambridge, N. Y. King of Denmark Spinach..... Frank Howard, Pittsfield	77	June
D-8	Round Thick Leaved Spinach..... G. E. Doane, Middleboro	69	June
D-82	ROSS BROS. CO., Worcester, Mass. Early Giant Thick Leaf Spinach..... Casey Auto Supply Co., Milford	86	June
D-261	F. H. WOODRUFF & SONS, Milford, Conn. Long Standing Spinach..... Platt & Goslee, Gt. Barrington	75	June
D-184	S. D. WOODRUFF & SONS, Orange, Conn. Round Thick Leaf Spinach..... Danvers Hardware Co., Danvers	87	June
D-68	Long Standing Savoy Spinach..... Holyoke Farm Machinery Co., Holyoke	76	June
<b>SQUASH</b>			
D-9	THOMAS W. EMERSON CO., Boston, Mass. Blue Hubbard Squash..... T. W. Pierce Hardware Co., Middleboro	96	June
D-196	Early White Bush Scallop Squash..... Whitcomb-Carter Co., Beverly	39	June

\*\* Retested.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>SQUASH—Continued</b>			
D-96	THOMAS W. EMERSON CO.,—Continued Golden Hubbard Squash..... Uxbridge Hardware, Uxbridge	91	June
D-100	Summer Crookneck Squash..... G. C. Winter Co., Southbridge	83	June
D-223	Warren Squash..... Whitcomb-Carter Co., Beverly	92	June
D-71	CHAS. C. HART SEED CO., Wethersfield, Conn. Table Queen Squash*..... Holyoke Farm Machinery Co., Holyoke	39	June
D-131	LEONARD SEED CO., Chicago, Ill. Warty Hubbard Squash..... J. B. Sibley & Son, Ware	84	June
D-154	JEROME B. RICE SEED CO., Cambridge, N. Y. Giant Early Summer Crookneck Squash..... New England Sales Co., Mansfield	95	June
D-225	Golden Summer Crookneck Squash..... C. A. Noyes Co., Brockton	75	June
D-246	Improved Hubbard Squash..... Frank Howard, Pittsfield	100	June
D-94	ROSS BROS. CO., Worcester, Mass. Early Crookneck Summer Squash..... Casey Auto Supply Co., Milford	86	June
D-297	S. D. WOODRUFF & SONS, Orange, Conn. Summer Crookneck Squash..... White Hardware Co., Framingham	97	June
<b>SWISS CHARD</b>			
D-35	CHAS. C. HART SEED CO., Wethersfield, Conn. Swiss Chard..... C. F. Paige Hardware Co., Athol	90	June
D-269	JEROME B. RICE SEED CO., Cambridge, N. Y. Swiss Chard..... Newcomb Hardware Co., Greenfield	77	June
<b>TOMATO</b>			
D-13	JOSEPH BRECK & SONS CORP., Boston, Mass. Stone Tomato..... H. V. Lawrence, Falmouth	91	May
D-155	THOMAS W. EMERSON CO., Boston, Mass. Acme Tomato..... W. C. Fuller Co., Mansfield	59	June
D-86	Beefsteak Tomato..... Uxbridge Hardware, Uxbridge	70	May
D-159	New Stone Tomato..... Murphy Hardware, Salem	85	June
D-92	FERRY-MORSE SEED CO., Detroit, Mich. Earliana Tomato..... Brown Bros., Northbridge	68	May
D-288	BUDD D. HAWKINS, Reading, Vt. Budd's Selected Sparks Earliana Tomato..... Arthur C. Lamson, Marlboro	75	June

\* 1929 seed. \*\* Retested.

## 1931 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Concluded

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1931 Month of Test
<b>TOMATO—Continued</b>			
D-126	LEONARD SEED CO., Chicago, Ill. Bonny Best Tomato..... J. B. Sibley & Son, Ware	78	June
D-180	John Baer Tomato..... A. I. Task, Brockton	65	June
D-19	JEROME B. RICE SEED CO., Cambridge, N. Y. John Baer Tomato..... The Fiske Corp., Natick	58	May
D-237	F. H. WOODRUFF & SONS, Milford, Conn. Bonny Best Tomato..... Spanias Hardware, Haverhill	84	June
D-148	New Stone Tomato..... Martin Hardware Co., No. Attleboro	85	June
<b>TURNIP</b>			
D-214	JOSEPH BRECK & SONS CORP., Boston, Mass. Red Strap Leaf Turnip**..... Pentucket Hardware, Haverhill	36	July
D-198	THOMAS W. EMERSON CO., Boston, Mass. White Egg Turnip..... Whitcomb-Carter Co., Beverly	67	June
D-85	White Rock Turnip**..... Uxbridge Hardware, Uxbridge	41	July
D-16	LAKE SHORE SEED CO., Dunkirk, N. Y. Early Purple Top Strap Leaved Turnip..... H. G. Cox, Barnstable	92	June
D-88	D. LANDRETH SEED CO., Bristol, Pa. Ruta Baga Turnip**..... O. M. Kindler, Webster	54	July
D-259	JEROME B. RICE SEED CO., Cambridge, N. Y. Improved American Purple Top Turnip**..... Pierson Hardware Co., Pittsfield	50	July
D-18	Ruta Baga Turnip**..... The Fiske Corporation, Natick	46	June
D-17	Improved American Purple Top, Ruta Baga Turnip..... G. E. Doane, Middleboro	83	June
D-111	Ruta Baga, or Swede Turnip..... H. I. Goodsell, Petersham	80	June
D-260	F. H. WOODRUFF & SONS, Milford, Conn. Early Purple Top Strap Leaf Turnip..... Platt & Goslee, Gt. Barrington	63	June
D-204	Sweet Germain Turnip**..... M. W. Dugan Co., Newburyport	24	June
D-183	S. D. WOODRUFF & SONS, Orange, Conn. Long Island Ruta Baga Turnip..... Danvers Hardware Co., Danvers	76	June
D-62	White Egg Turnip..... Holyoke Farm Machinery Co., Holyoke	88	June
D-46	WHOLESALE UNKNOWN Yellow Rutabaga Turnip**..... Burnap Bros., Shelburne Falls	7	July
<b>WATERMELON</b>			
D-276	F. H. WOODRUFF & SONS, Milford, Conn. Coles Early Watermelon..... F. I. Webster Co., Greenfield	97	June

\*\* Retested.

## Type and Variety Studies of Garden Peas, 1931

Conducted in Conjunction with the Department of Vegetable Gardening, M. S. C.

The field trials of garden peas included 32 varieties from 118 sources. The seed in all cases was purchased from the seed firm or grower. In conducting the trials every effort was made to maintain uniform cultural conditions. Comparisons of varieties and of strains of a given variety were fairly made.

In general the sorts included were fairly true in type for the variety designated by the seedsman. A few lots showed some variation in plant characteristics and in pod shape and size. For the most part, however, this was due not to seed mixture but rather to variation within the individual sort.

The tabular summary includes only the varieties and strains of which detailed records were taken. It was impossible to get such records in some cases because of heavy rains which flooded one portion of the test plot during the early part of the growing season.

### Explanation of the Table

**Stock Number.** This is the seedsman's stock label or number.

**Type Name.** A large number of names are used in the seed trade which represent varieties that differ from one another in only a few minor characteristics. The type name used represents the most standard variety closely related to the sort tested.

**Maturity Season** indicates the approximate length of time required for the pods to develop to a marketable size.

1st Early.....less than 52 days

Early.....52 to 60 days

Main.....60 to 70 days

**Type of Plant and Pod** includes all those factors usually considered as designating the characteristics of a given sort: plant height, growth habit, leaf, stem, flower, and pod.

**Quality.** Under this heading the color and taste of the peas were considered as well as the length of time they remained in an edible condition.

Very good—good color and taste, remained in edible condition a reasonable length of time.

Good—good color and taste, variable as to time factor.

Fair—good color, flat taste, hardened rapidly.

Poor—faded color, flat taste, hardened rapidly.

**Rating.** Each lot grown was evaluated from the standpoint of trueness to type and general performance. Uniformity of plant and pod maturity, filling out of pod, quality of pea, yield, disease, and type were especially considered.

## TYPE AND VARIETY STUDIES OF GARDEN PEAS, 1931

Variety and Source	Stock Number	Type Name	Maturity Season	Laboratory Germination	Type of Plant and Pod	Quality	Rating
<b>Extra Early</b>							
Burpee.....	737	Prolific Early Market	1st Early	84	Good	Fair	Fair to good
Gregory.....				66	Very uniform	Good	Very good
<b>Laxton's Superb</b>							
Woodruff, F. H.....	253	Early Bird	Early	71	Fair, 10% variation	Good	Fair to good
Stokes.....				82	Fair, 10% variation	Poor	Very poor
<b>Blue Bantam</b>							
Livingston.....	083	Laxtonian	Main	74	Good, uniform	Fair	Fair to good
Forbes.....				82	Good, uniform	Very good	Excellent
Grey.....	LOU-1			62	Fair, 10% variation	Poor	Poor
Perry.....				66	Good, uniform	Fair	Fair to good
Burpee.....	754			63	Good, uniform	Good	Very good
<b>Hundredfold</b>							
Perry.....	53699	Laxtonian	Main	77	Good, uniform	Good	Very good
Harris.....				84	Good, uniform	Very good	Excellent
Forbes.....				80	Good, uniform	Good	Very good
Grey.....	A-29			72	Fair, 5% variation	Fair	Poor
Breck.....				77	Good, uniform	Good	Fair to good
<b>Laxtonian</b>							
Hart & Vick.....		Laxtonian	Main	82	Good, uniform	Poor	Poor
Perry.....	42072			62	Good, pods variable in size	Good	Fair to good
Woodruff, F. H.....	1295			75	Good, uniform	Fair	Fair to good
Livingston.....	880			70	Very uniform plant and pod	Good	Very good
Forbes.....				85	Good, uniform	Fair	Fair to good
Perry.....				70	Good, uniform	Good	Very good
<b>Laxton's Progress</b>							
Burpee.....	796	Laxtonian	1st Early	63	Very uniform	Very good	Excellent
Gregory.....				81	Good, uniform	Fair	Poor
Hart & Vick.....	1025			48	Good, uniform	Fair	Poor
Woodruff, F. H.....	1297			90	Very good, uniform	Very good	Excellent
Livingston.....	080			68	Good, uniform	Good	Very good
Harris.....				74	Good, uniform	Good	Poor
Forbes.....				82	Fair, 10% variation	Fair	Fair to good
Grey.....	R-N.P.			69	Good, uniform	Good	Very good
Perry.....				84	Good, uniform	Good	Very poor
Breck.....				82	Fair, 15% variation	Poor	Very poor
Stokes.....				85	Good, pods poorly filled	Good	Fair to good

Pioneer	Laxtonian	Early				
Gregory.....			77	Good, uniform	Good	Fair to good
Livingston.....			71	Good, uniform	Good	Very good
Breck.....	711		89	Good, uniform	Good	Very good
Acquisition						
Livingston.....	Early Bird	Early	85	Fair, 10% variation	Fair	Poor
Premium Gem						
Woodruff, F. H.....	Premium Gem	Early	73	Good, slight variation	Good	Fair to good
American Wonder						
Perry.....	American Wonder	Early	82	Good, uniform	Good	Very good
Little Marvel						
Burpee.....	Little Marvel	Early	90	Good, uniform	Good	Very good
Gregory.....			67	Good, uniform	Good	Very good
Hart & Vick.....			65	Good, pods variable in size	Good	Fair to good
Perry.....			82	Very uniform	Good	Excellent
Harris.....			73	Good, pods variable	Good	Fair to good
Forbes.....			84	Good, uniform	Good	Very good
Grey.....			77	Good, pods variable	Good	Fair to good
Perry.....	A.O.E.		82	Very uniform	Very good	Excellent
Breck.....			77	Good, uniform	Good	Very good
Stokes.....			85	Good, uniform	Good	Very good
Nott's Excelsior						
Gregory.....	Gem (Little Marvel)	Early	88	Good, uniform	Fair	Fair to good
Perry.....			87	Good, uniform	Fair	Fair to good
Sutton's Excelsior						
Grey.....	Sutton's Excelsior	Early	68	Good, uniform	Fair	Fair to good
Perry.....	A.O.E.-6		82	Good, uniform	Good	Very good
Alaska						
Gregory.....	Alaska	1st Early	53	Very uniform	Fair	Very good
Hart & Vick.....			85	Very variable plant and pod	Poor	Poor
Perry.....			76	Good, uniform	Fair	Very good
Woodruff, F. H.....			94	Good, uniform	Fair	Very good
Harris.....			89	Variable plant and pod	Fair	Poor
Forbes.....			91	Good, uniform	Poor	Fair to good
Perry.....			87	Good, uniform	Fair	Very good

## TYPE AND VARIETY STUDIES OF GARDEN PEAS, 1931—Concluded

Variety and Source	Stock Number	Type Name	Maturity Season	Laboratory Germination	Type of Plant and Pod	Quality	Rating
<b>Thomas Laxton</b>							
Burpee.....	746	Thomas Laxton	Early	68	Uniform	Good	Excellent
Hart & Vick.....				82	Uniform	Good	Very good
Perry.....	51002			90	Uniform	Poor	Fair to good
Woodruff, F. H.....	32-227			86	Good, uniform	Poor	Fair to good
Harris.....				69	15% variation in plant size	Good	Poor
Forbes.....				76	Good, uniform	Good	Very good
Perry.....				82	Plants variable in size	Good	Fair to good
Stokes.....				86	Uniform	Fair	Fair to good
<b>World Record</b>							
Harris.....		World Record	Early	81	Uniform, pods short	Fair	Fair to good
Grey.....				80	Good, uniform	Good	Very good
Forbes.....	A.O.E.-3			91	Pods long, poorly filled, uniform	Fair	Poor
Perry.....				71	Good, uniform	Fair	Fair to good
<b>Lincoln</b>							
Harris.....		Lincoln	Main	63	Uniform	Good	Fair to good
<b>Gradus</b>							
Burpee.....	745	Gradus	Main	81	Good, uniform	Fair	Fair to good
Hart & Vick.....				57	Plants and pods variable	Good	Fair to good
Perry.....	15604			63	Very uniform	Very good	Excellent
Woodruff, F. H.....	32-237			87	Good, uniform	Good	Very good
Livingston.....	880			91	Pods variable in size	Good	Fair to good
Harris.....				79	Good, uniform	Fair	Fair to good
Forbes.....				87	Good, uniform	Good	Very good
Grey.....				75	Good, uniform	Good	Very good
Perry.....				72	Good, uniform	Good	Very good
<b>Sutton's Ideal</b>							
Harris.....			Early	78	Plants and pods variable	Poor	Poor
<b>Pilot</b>							
Forbes.....		Pilot	Main	86	Good, pods variable in size	Fair	Poor
Grey.....				81	Good, uniform	Fair	Fair to good
Burpee.....	A.N.P.			65	Good, uniform	Fair	Fair to good
Breck.....	742			61	Good, uniform	Fair	Fair to good
Stokes.....				82	Pods variable	Fair	Poor



### Presence of Seed-Borne Diseases

Germination of the seed used for variety studies of garden peas was recorded from laboratory tests and also from duplicate lots planted in the field. Record of the laboratory germination appears in the preceding table, but no field tests are shown. Because of abnormally late planting, made necessary by the poor physical condition of the soil in the test plot, no fair comparison of results can be made. However, the field planting for germination and the permanent planting for variety tests, as well as the germination tests in the laboratory, gave opportunity to observe the presence and effect of seed-borne diseases upon field performance. Professor O. C. Boyd, Extension Pathologist, gives the following summary of his observations.

#### Laboratory Germination Test

1. Number of seed lots, 112; 200 seeds each.
2. Number of lots which showed the following conditions:
  - a. 8-25% of the seeds discolored, 15; 26-50%, 52; 51-75%, 33; 76-100%, 12.
  - b. Deep cotyledonary lesions: 26.
  - c. Soft rot of seeds: Light 16; medium 16; heavy 6.
  - d. Mold contaminations: Light 51; medium 29; heavy 22.
  - e. Blotch: Light 32; medium 18; heavy 12.
3. Organisms isolated from shallow cotyledon stains and lesions: Slow growing yellow and white bacteria; *Cladosporium* sp.; *Penicillium* sp.
4. Organisms isolated from deeper cotyledon lesions: *Fusarium* sp.; slow growing white and yellow bacteria; *Ascochyta pisi* (leaf and pod spotting fungus).

#### Field Germination Test

1. Number of seed lots which showed the following diseases when the plants were from four to six inches high:
  - a. Root rots (*Fusarium*, *Aphanomyces*), 47; pronounced, 5.
  - b. Wilts (*Fusarium*, et al.), 50; pronounced, 9.
  - c. Mosaic, 8.
2. Number of lots showing good stand, 38; medium, 25, poor, 46.
3. Kinds of organisms isolated from diseased plants: *Fusarium* sp.; *Aphanomyces* sp.; *Ascochyta pisi*; *Penicillium* sp.; *Pythium* sp.; slow growing yellow and white bacteria.

#### Field Permanent Planting

1. Number of lots that showed the following diseases:
  - a. Root rots (*Fusarium*, *Aphanomyces*), 26; pronounced, 8.
  - b. Wilt, (*Fusarium*, et al.) 16; pronounced, 5.
  - c. Undetermined blight, 9.
  - d. Mosaic, 12.
  - e. Leaf and pod flecking, 16; *Ascochyta* spot, 15.
  - f. Bacterial leaf and pod spot and stem blight, 2. (3 & 3A)

#### Relation Between Low Germination in Laboratory and Field Stand

There was not a consistent or direct relation between field stand and laboratory germination; yet, 80% of the lots that showed a germination of 70% or less in the laboratory also showed a correspondingly low stand in the field tests. The reverse, however, was not consistently true.

### Occurrence of Seed-Borne Diseases<sup>1</sup>

Lots from which were isolated the *Ascochyta* spot, *Fusarium* root-rot, and bacterial pod and leaf spot organisms, also showed prominent symptoms of those diseases in the field plantings.

It is believed that the "Undetermined Blight" disease which was prevalent in several lots of the permanent planting, may have been associated with one type of seed-coat stain and cotyledon lesion. It does not correspond to any of the known diseases of peas.

The symptoms of the bacterial leaf and pod spot disease which were present in two lots of the permanent planting were quite different from those of the well-known bacterial blight caused by *Bacterium pisi* (Sackett) EPS. It is believed to be a seed-borne disease that has not been described in this country.

The very characteristic "Blotch" spot on seed coats and cotyledons in the laboratory germination test appeared to have some relation to the occurrence of

<sup>1</sup> Isolations were made from only a few of each kind of disease observed in the laboratory and field tests.

root diseases in the field plantings. There is a possibility that it may be caused by *Cladosporium vignae*, the cause of a leaf and pod spot of cowpea.

### Type and Variety Tests of Legumes

Conducted in Conjunction with the Department of Agronomy, M. S. C.

Plantings of red clovers, sweet clovers, and alfalfas were made July 2, 1930, in rod row areas. Growth was good in all cases except two, where weak germination was the main difficulty. Readings taken twice during the 1931 season showed the following:

ALFALFA		
Number	Name	Type Found
010 -G10	Grimm	Variegated (Grimm)
0129-G124	Grimm	Variegated
0131-G126	Grimm	Variegated
0140-G135	Common	Purple flowered (Common)
0143-G138	Grimm	Variegated
025 -G25	Grimm	Variegated
0280-G269	Northwestern	Variegated
0346-G328	Grimm	Variegated
060 -G59	Grimm	Variegated
RED CLOVER		
0101-G99	Medium Red	Medium Red
011 -G11	Pan-American Red	Medium Red
0113-G110	Matrix, Medium Red	Mammoth Red
0152-G147	Red	Mammoth Red
0174-G168	Matrix Red	Medium Red
026 -G26	Medium Red	Medium Red
0282-G271	Red	Mammoth Red
0347-G329	Red	Medium Red
053 -G52	Red	Medium Red
063 -G62	Red	Medium Red
07 -G7	Medium Red	Medium Red
082 -G80	Red	Medium Red
SWEET CLOVER		
0118-G114	White Blossom	White Blossom, Biennial
0154-G149	White Blossom	White Blossom, Biennial

### Type and Variety Studies of Onions, 1931

Conducted in Conjunction with the Department of Vegetable Gardening, M. S. C.

The field trials of onions included 40 different named sorts from 29 sources, or 124 varieties and strains of varieties. The 1931 trials were conducted in a similar manner to those of 1930 which were reported in Control Bulletin 56, December 1930. The results of the trials, because of their similarity to the results of 1930, are not presented in detailed tabular form, but rather in a few brief summarized statements.

1. In general the lots were quite true in type and performance for the variety designated by the seedsman on his package.

2. The 1931 trials did not show as high a percentage of type mixtures as those of 1930, especially in whites and reds mixed with the yellows.

3. On a field performance basis, the yellow varieties of the Danvers and Southport Yellow Globe types are better adapted for Connecticut Valley culture than are the so-called mild varieties of the Spanish or Bermuda types.

4. Varieties of the Spanish and Bermuda types can be successfully grown in the Connecticut Valley. The onions, however, are not so mild as those grown in regions having a longer, cooler growing period. In the Connecticut Valley they can be grown for the local fall market, but they are not adapted for winter shipping, nor do they keep well in storage.

5. Much confusion exists in onion nomenclature because of the large number of synonymous sorts having distinct or different names.

### Comparative Laboratory and Field Germinations of Onion Seed Used for Type and Variety Studies

In order to determine what germination may be expected of onion seeds sowed in the field, compared with laboratory germination of samples of the same seed, samples of each of the 124 varieties and strains of onions used for type and variety studies were germinated in the laboratory and in the field, 200 seeds being used for each test.

In the laboratory two methods were employed: between blotters for 10 days at 68° F.; in soil chambers containing sterilized soil for 14 days at 68° F.

For the field tests a typical onion soil was prepared in conformance with good crop practice, and the seeds were sown by hand in drills and covered with  $\frac{1}{4}$  inch of soil. The seed had germinated sufficiently for final count at the end of 14 days. For the 21 days elapsing between the first sowing and the final counting of the last sample sown, the mean soil temperature was 70.4° F. and the mean atmospheric temperature was 64° F.

Only those seedlings were counted which might be expected to produce a crop of onions in the field.

The average of all germinations was:

	<i>Per cent</i>
Laboratory tests	
In blotters.....	70.66
In soil chambers.....	69.02
Field tests.....	62.47

It will be noted that there was only 1.64 per cent less germination in laboratory soil chambers than in blotters. This may be accounted for because of the added resistance of the soil. In the field the difference was more pronounced, being 8.19 per cent less than in blotters and 6.55 per cent less than in soil chambers. The difference between field germination in soil and laboratory germination in soil chambers cannot be accounted for merely through a difference in soil resistance. Some of the factors noted which were responsible for this difference were erosion of the soil by rain washing out of an occasional seed, throwing out of seed by worms, cutting off of seedlings by insects and fungi, burial of a seed beneath lumps of hard soil or small stones, etc. Factors such as those mentioned vary greatly in different seasons and even in different fields the same season. Consequently no figures are obtainable which will accurately represent expected field germination under all conditions. Assuming, however, that all factors taken into consideration during this field experiment represent the average for typical onion soils in this locality for the spring of 1931, field germination was approximately 8 per cent less than laboratory blotter germination.



MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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Twelfth Annual Report on  
Eradication of Pullorum Disease  
in Massachusetts

By

H. Van Roekel, K. L. Bullis, O. S. Flint and Miriam K. Clarke

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In this bulletin are reported the results of investigations concerning pullorum disease and its eradication. The object of the work here described is to gain more knowledge about the nature of this disease. This in turn will aid in the establishment and maintenance of pullorum disease-free flocks, which is the primary motive of our eradication program.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.

# TWELFTH ANNUAL REPORT ON ERADICATION OF PULLORUM DISEASE IN MASSACHUSETTS 1931-32

By H. Van Roekel, K. L. Bullis, O. S. Flint and Miriam K. Clarke<sup>1</sup>

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## INTRODUCTION

In the eradication of pullorum disease, problems of great import have been encountered. The progress in eradication is greatly assisted by removing the various obstacles that impede our efforts. During the past few years, investigations have been made of some of these problems in order to bring about a more comprehensive understanding of pullorum disease, which should enable one to institute a more effective eradication program.

These investigations and the testing results for the 1931-32 season are reported in the following order:—

1. Antigen Studies.
2. Jellied Blood Samples.
3. Non-Infected Females May Contract Pullorum Disease through Eating Fresh Eggs Laid by Infected Hens.
4. Exposure of Pullorum Disease-Free Birds to Soil and Litter Contaminated with Feces from Positive Reacting Birds.
5. Dissemination of *S. pullorum* Infection Among Sexually Immature Females.
6. Pathogenicity of *S. pullorum* in Relation to Aves Other Than Chickens.
7. Agglutinins in Chicks.
8. Avenues of Infection.
9. Observations Concerning Diagnostic Tests for Pullorum Disease.
10. Intensive Testing Versus Annual Testing in Pullorum Disease Eradication.
11. Testing Results for the 1931-32 Season.

## ANTIGEN STUDIES

As the application of the agglutination test in control and eradication of pullorum disease has become more and more general, numerous experiment stations and state laboratories have attempted to standardize their procedure with the best methods. Their experience has resulted in certain practices becoming established criteria in the treatment of cultures to be used for antigen and the treatment of the antigen after it has been made. In 1931, "Standard Methods of Diagnosis of Pullorum Disease in Barnyard Fowl" (69) were formulated and are in the process of adoption by the Conference of Official State and Federal Research Workers in Animal Diseases of America. The influence of two factors in the preparation and handling of antigen have been studied during the past two years; first, the effect of age upon the quality of concentrated and dilute antigen stored at 8° C.; and second, the danger that either too frequent transfer of stock cultures or their storage at low temperature may cause them to produce an inferior test fluid.

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<sup>1</sup> Appreciation is extended to Dr. John B. Lentz, Head of the Department of Veterinary Science, for administrative assistance and for suggestions made concerning this bulletin.

### The Technique Used in Making the Antigen

The method of making antigen has changed since the first application of the test by Jones (52), as reported in 1912. In his early work he used an antigen prepared by incubating the culture for 72 hours and used a saline solution containing 0.6 per cent sodium chloride and 0.5 per cent phenol for washing off the growth, and then inspissated the washings for 2½ hours at 60° C.; but later (53) he stated that the heated antigen was less satisfactory and also changed the saline solution to 0.88 per cent sodium chloride. Gage, Paige, and Hyland (36) incubated inoculated agar slants one to two days and shook the washings for one-half hour in a mechanical shaking machine before the suspension was filtered through cotton. This, with the omission of the shaking, was essentially the method used by Rettger, Kirkpatrick, and Jones (76). Gwatkin (40) incubated the inoculated agar for four days, standardized the turbidity by Gates' method, and used phenol as a preservative. Brunett (10) incubated his cultures for 24 hours.

Antigens for this investigation were prepared in the same way throughout, and the technique of making the agglutination tests and the interpretation of the results were identical. Strains of *Salmonella pullorum* chosen for antigen were checked for purity by microscopic examination of stained smears and inoculation into broth media containing 1 per cent of the carbohydrates, dextrose, lactose, dulcitol (or maltose), and sucrose. The solid medium used was meat extract agar containing 0.3 per cent meat extract, 1 per cent peptone, and 1.5 per cent agar. Kolle flasks were inoculated with the pure cultures, incubated for 72 hours at 37° C., and the growth washed off with a salt solution containing 0.85 per cent sodium chloride and 0.5 per cent phenol. The washings were filtered through cotton in a funnel and combined. The diluent for the test fluid was physiological saline solution containing 0.25 per cent phenol. The turbidity and pH of the antigens were standardized as required. Agglutination tests were set up in dilutions of 1:10 and higher, sufficient to detect the titer of the serum. In a few cases in the earlier tests not enough tubes were used for a few sera where the titer exceeded 20,480. Tests were incubated for 24 hours at 37° C. and an additional 20 to 24 hours at room temperature. Reactions were recorded as follows, and given a corresponding numerical value for the purpose of comparative study:

	Recorded Reaction	Numerical Value
Complete agglutination.....	4	4
Incomplete agglutination.....	3	3
Partial agglutination.....	2	2
Slight agglutination.....	1	1
No agglutination.....	0	0

### Effect of Age on the Quality of Concentrated Antigen

A number of workers studying antigen or using it in routine tests have expressed opinions concerning the length of time antigen may be held without deterioration. Gage, Paige, and Hyland (36) reported in 1914 that "test fluid properly preserved on ice will keep in a very active state for more than two months"; and later, in 1925, Brunett (10) stated that a "quantity of antigen can be prepared and kept for a period of months when stored in a cool place in an uncontaminated condition." Gwatkin (40) agreed that "antigen was found to stand up well and could be kept for months in the ice chest." Mallman (60) found that *S. pullorum* antigen could be kept for 12 months at approximately 10° C., but Stafseth and Thorp (86) differ widely, stating that an antigen may



decrease in agglutinability or become less stable and that fresh antigens are usually more satisfactory than those that have been kept more than 2 weeks. Doyle (27) found that, in antigens from cultures being studied, storage up to 36 days had no influence on the titer. Biely (5), using the rapid serum method, found perfect agreement in 171 tests between an antigen 3 years and 7 months old and an antigen 1 day old. Jones (53) found that diluted test fluid might be kept for "several months in a refrigerator."

For the study of the effect of age on concentrated antigen, a quantity of antigen was prepared from three strains, Nos. 10, 11, and 20, of *S. pullorum*, which had been successfully used in the production of antigen for a large number of tests. Strain No. 11 was isolated from the ovary of a hen and Nos. 10 and 20 were isolated by Dr. Rettger of Yale University from baby chicks in 1916 and 1917, respectively. This stock antigen which was about 20x tube No. 1 of the McFarland nephelometer standard was stored at 8° C. A portion was diluted and tested when it was prepared. Further tests were made at biweekly intervals, with three exceptions when 4 weeks elapsed between tests, for the 583 days over which the investigation extended. On the second and succeeding tests a fresh antigen composed of the same strains was prepared and tested in the same manner as the stored antigen. Both antigens were adjusted to a turbidity between 0.75 and 1.0 on the McFarland nephelometer scale and a pH of 8.4. Fresh sera were used for each test. Samples were taken from each of 10 birds known to be reactors and 5 non-reactors. Comparative tests were made 37 times with a total of 555 sera (365 positive, 185 negative, and 5 which were cloudy and recorded as unsatisfactory).

Table 1 gives the results of the tests in numerically computed values and an analysis of the positive and negative reactions and relative sensitivity. Judged by this standard, there appears to be little choice between the two antigens and no evidence of inferiority in the stored antigen as it grows older. In 18 of the tests the stored antigen had a slightly higher value against 19 times when the freshly prepared had a higher value. The variations observed at each test might readily be explained in part as due to differences in individual sera. It may be possible that a difference in the contents of any sera, aside from agglutinins, might cause a variation in the reaction with even the most satisfactory antigen. Furthermore, such factors as technique of testing and interpretation of reactions might influence the variations that have been observed. The macroscopic observation of the tests showed no difference in the type of agglutination. The reactions with the one antigen were as typical and distinct as with the other. No progressive change in the stored antigen affecting its efficiency as an agglutination test fluid occurred. The turbidity of the stock antigen decreased from 20x to 15x tube No. 1 of the nephelometer during the duration of the experiment.

### Effect of Age on Dilute Antigen

The effect of storage on dilute antigen was investigated in two trials: the first, less extensive, over a period of 5 weeks, and the second extending over 15 weeks. A report of the first is omitted because the results were similar to those of the second. In many laboratories sodium hydroxide is added to dilute antigen to eliminate, as far as possible, "cloudy reactions" and has been reported as a valuable agent in this respect, first by Mathews (62) and later by Stafseth and Thorp (86), Casman, Valley, and Rettger (17), Bleecker and Schilling (6, 7), and the Connecticut (Storrs) Agricultural Experiment Station (19). Dilute antigens with and without the excess sodium hydroxide were tested.

The three strains of *S. pullorum* used for this experimental antigen were the same as those used in the work with concentrated antigen. The stock antigen



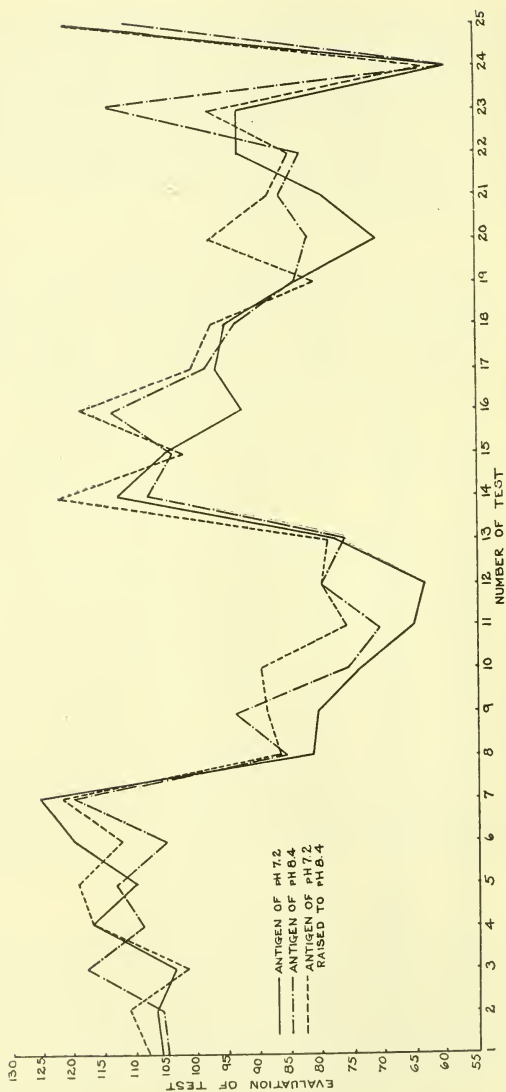
was prepared and diluted to a turbidity equal to tube No. 1 of the McFarland nephelometer. One-third had sufficient sodium hydroxide added to raise the pH to 8.4. The other two-thirds were stored with the pH at 7.2. Both portions were tested the day they were prepared and diluted. At later tests, these two antigens and a third, produced by adding N/20 sodium hydroxide to raise the pH to 8.4 to a portion taken from the stock of antigen of pH 7.2, were tested with 5 positive and 5 negative sera. Tests were made each day for 8 days, then at 10, 12, 14, 17, and 21 days of age, and each week to the conclusion of the experiment. Whenever tests were made the pH and turbidity of each of the stored portions of test fluid were determined.

TABLE 1.—RESULTS OF COMPARATIVE TESTS WITH STORED AND FRESHLY PREPARED ANTIGENS

No. of Test	Value of Recorded Reaction of All Sera		More Sensitive Antigen	Positive Serum Reactions			Number of Negative Sera Reacting		
				Higher	Identical		Both	S. only	F. only
	S.*	F.*		S.	F.				
1	242	176	S	8	0	1**	2	0	0
2	177	160	S	4	1	5	0	2	0
3	338	328	S	5	3	2	0	0	0
4	249	178	S	9	1	0	1	3	0
5	242	254	F	3	6	1	1	1	1
6	221	199	S	8	1	1	1	0	0
7	218	237	F	3	4	2**	0	0	0
8	287	276	S	5	4	1	2	0	0
9	143	140	S	0	5	3**	1	0	2
10	215	240	F	0	7	2**	1	0	0
11	245	292	F	0	9	1	1	0	0
12	242	277	F	0	10	0	0	0	0
13	208	215	F	2	4	2**	1	0	0
14	230	244	F	2	7	1	3	0	1
15	230	246	F	3	6	1	2	0	0
16	200	226	F	2	7	1	0	1	0
17	230	240	F	3	5	2	0	2	1
18	218	256	F	1	7	2	3	0	2
19	230	226	S	3	4	3	1	1	1
20	263	272	F	3	5	2	5	0	0
21	296	273	S	8	0	2	5	0	0
22	271	258	S	5	2	3	3	2	1
23	226	251	F	1	8	1	2	0	0
24	271	282	F	4	6	0	1	0	1
25	233	245	F	2	7	1	2	0	0
26	187	214	F	0	10	0	0	0	2
27	219	248	F	1	8	1	1	2	2
28	173	184	F	2	5	3	0	0	0
29	216	237	F	3	7	0	2	1	0
30	207	189	S	4	2	4	0	1	0
31	184	170	S	2	3	5	0	1	0
32	204	202	S	5	4	1	1	1	0
33	221	191	S	6	1	3	1	0	0
34	175	173	S	3	6	1	0	2	2
35	230	221	S	6	4	0	0	0	0
36	219	209	S	5	3	2	1	0	1
37	193	190	S	3	4	3	0	1	0
TOTALS	8,353	8,421	S18 F19	176	62	127	43	20	18

\* S—Stored antigen. F—Freshly prepared antigen.

\*\* The remainder of the reactions of the ten positive sera were recorded as unsatisfactory.



GRAPH 1—Evaluation of the Tests Which Were Made With Three Different Antigens

Contrary to the report of Stafseth and Thorp (86) no change was observed in the turbidity. There was a slight change noticed in the pH, however, beginning at the eighth week when the pH of the 8.4 antigen had decreased slightly. By the twelfth week, the alkalinity had decreased so that the pH was 8.2, and at the last test (fifteenth week) it was 8.0-8.2. The pH 7.2 antigen began to show a decrease in alkalinity about the twelfth week and had a pH of 7.0 by the fifteenth week. Comparing the results on a numerical basis as in the case of the concentrated antigen, the antigen of pH 7.2 raised to 8.4 at the time of the test was the most sensitive in 14 of the 25 times it was tested; in 5 tests it was more sensitive than one of the other antigens and in 3 it was identical with one other antigen; and in only 3 tests was it the least sensitive. The almost parallel tendency of the three to fluctuate is plainly shown in Graph 1. The summary of the values from which the data for the making of the graph was derived is as follows:

	pH 7.2 antigen	pH 8.4 antigen	pH 7.2 raised to 8.4 antigen
Number of tests.....	25	25	25
Number of tests most sensitive.....	4	3	14
Number of tests more sensitive than one other antigen.....	7	9	5
Number of tests least sensitive.....	11	11	3
Number of tests identical with one other.....	3	2	3

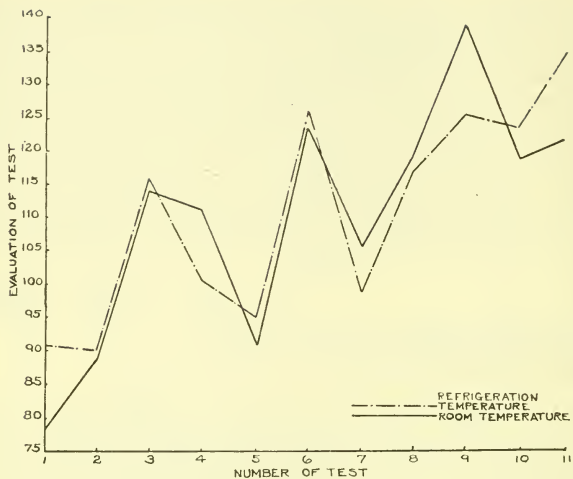
The type of agglutination in the tests showed no appreciable difference during the course of the experiment. Cloudy reactions occurred in the pH 7.2 antigen in a few instances. The pH 7.2 antigen seemed slightly less sensitive on the whole and the pH 8.4 antigen not quite as sensitive as that to which sodium hydroxide was added at the time of the test. However, the results suggest that a diluted antigen with pH 8.4 loses very little, if any, of its antigenic value during a period of fifteen weeks.

### Effect of Frequent Transfers and Low Temperature on the Cultures

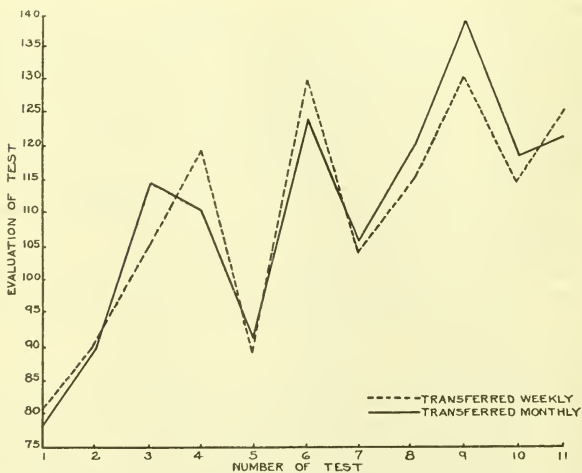
In view of the fact that very frequent transfer to fresh medium and storage at refrigerator temperature may cause changes in the behavior and morphology of many bacteria, *S. pullorum* was treated in this way to observe whether any marked changes resulted and whether the antigens produced from the cultures were in any way less satisfactory for agglutination tests. Speaking of *S. pullorum* for agglutinable antigen, Jones (53) states that freshly isolated or even second or third generation cultures give better results than those under cultivation for a longer time; but Tittsler (88) after the work had been in progress much longer was unable to establish any correlation between "agglutinability and the length of time strains had been carried in stock on artificial media."

Casman, Valley, and Rettger (17) in some detailed work found that antigens prepared from cultures grown at different temperatures (37°, 34°, 30°, 24°, 20°, and 16° C.) and for different periods of time (1, 2, 3, 5, 6, 9½, and 10 weeks) revealed no agglutinable differences. Antigens of equal value were also prepared from cultures transferred twice a week for a period of 10 weeks and incubated at 37°, 30°, and 16° C.

The temperature chosen for the observations at this laboratory was approximately 8° C., and the interval between transfers to fresh medium was one week. A set of cultures held at a temperature approximately 22° C. and transferred to fresh medium once a month served as a control. Three strains of *S. pullorum*, designated as Nos. 17, 19, and 20, were studied. The strains were all isolated by Dr. Rettger of Yale University, strain No. 17 from a baby chick in 1916, strain No. 19 from a hen in 1911, and strain No. 20 from a baby chick in 1917. Three agar slant subcultures were made from each strain and incubated 48 hours at 37° C. The cultures were distributed as follows: one of each strain placed



GRAPH 2—Evaluation of the Tests Which Were Made With Two Antigens, Each Prepared from Cultures Retained at Different Temperatures



GRAPH 3—Evaluation of the Tests Which Were Made With Two Antigens, Each Prepared From Cultures Transferred at Different Intervals

at 8° C. and the other two held at room temperature. Of the two at room temperature, one set was chosen to be transferred each week and the other once a month when each of the sets was transferred to duplicate agar slants as the first step in the preparation of antigen. After 24 hours' incubation, one of these was returned to its place of storage and the other used to inoculate the medium from which the growth was washed as antigen. From the three antigens prepared, tests were made with 5 positive and 5 negative sera. The antigen from the control cultures served as a standard of comparison for each of the other two antigens.

Graphs 2 and 3 show the relation of each antigen to the control antigen and the degree of fluctuation more clearly than can be described. A summary of the numerical deductions of the 11 different antigens prepared and tested is given below:

**Comparative Results on Antigens Prepared from Cultures Retained at Different Storage Temperatures**

	<i>Antigens prepared from cultures stored at temperatures</i>	
	8°C.	22° C.
Number of tests.....	11	11
Number of sera tested.....	110	110
Total value of all reactions.....	1,222	1,213
Number of positive sera tested.....	55	55
Number of positive sera with higher value.....	20	20
Number of positive sera with identical value.....	15	15
Number of negative sera tested.....	55	55
Number of negative sera reacting.....	15	19
Total value of reactions in negative sera.....	26	33
Number of tests more sensitive.....	7	4

**Comparative Results on Antigens Prepared from Cultures Transferred at Frequent Intervals**

	<i>Antigens prepared from cultures transferred</i>	
	<i>Monthly</i>	<i>Weekly</i>
Number of tests.....	11	11
Number of sera tested.....	110	110
Total value of all reactions.....	1,213	1,200
Number of positive sera tested.....	55	55
Number of positive sera with higher value.....	23	17
Number of positive sera with identical value.....	15	15
Number of negative sera tested.....	55	55
Number of negative sera reacting.....	19	15
Total value of reactions in negative sera.....	33	27
Number of tests more sensitive.....	6	5

Smears of the three sets of cultures were made and stained for microscopic examination and comparison six times during the experiment. Slight variations were observed, for the greater part, an irregularity in the size of the organism in each strain and a tendency to form short chains in some cases. The variations were similar for the cultures transferred frequently and for those held at 8° C.

The type of agglutination reactions of the different antigens appeared almost identical, comparing well with the degree of reactions from which the numerical data were compiled.

### Conclusions

1. Under the conditions of the investigation, concentrated *S. pullorum* antigen remained as sensitive and specific after 583 days' storage at approximately 8° C. as freshly prepared antigen.

2. Dilute antigen of a pH 8.4 did not suffer an appreciable decrease in any of its essential qualities in a period of 15 weeks when held at a temperature approximately 8° C.

3. Addition of sufficient sodium hydroxide to adjust the pH to 8.3-8.5 did not cause a detectable autolysis or clearing in dilute antigen during 15 weeks of storage at approximately 8° C.

4. Slight variations in the morphology of stock cultures held at 8° C. or transferred to fresh medium weekly were observed.

5. Antigens from cultures transferred weekly or stored at a temperature of approximately 8° C. for 49 weeks were as satisfactory for use in making agglutinable antigen as cultures held at 22° C. and transferred at monthly intervals.

### JELLIED BLOOD SAMPLES

In this laboratory jellied chicken blood samples are an important problem in preparing agglutination tests for the detection of pullorum disease carriers. An investigation was undertaken because most of the jellied blood samples require extra handling and some of the tests are not very satisfactory. There seems to be a scarcity of discussion on jellied samples in the literature on pullorum disease. At the first conference of Laboratory Workers in Pullorum Disease Control in 1928, and at later conferences, other laboratories reported occasional experiences with such samples.

In Massachusetts, the routine pullorum disease testing season extends approximately from September first to March first. The blood samples are collected by trained personnel designated as blood collectors. From an incision in the wing vein, 0.5 to 1 cc. of blood is collected into an 8 x 77 mm. tube. While the tubes are placed in a slightly inclined position, the surface of the coagulum does not become slanted. At the end of the day's work, the samples are iced, shipped by express, and usually arrive at the laboratory the following morning. After separating the clots from the walls of the tubes, the samples are centrifuged, and sera are transferred to agglutination tubes.

The term "jellied" as used in this report refers to a blood sample in which the supernatant serum presents the consistency of jelly. Such samples in the process of jelling may show various characteristics. Among the samples received at the laboratory some were not clotted 18 to 48 hours after collection. Approximately 50 per cent of these samples may jelly. The supernatant serum in some samples may be jellied while the blood constituents below will be in a fluid state. Furthermore, the entire column of serum is not always jellied. The lower portion of the column may be in a fluid or semi-fluid state, either with or without inclusion of blood cells. Occasionally the serum column may be completely jellied, containing either scattered cells or no cells, with the blood column below formed into a firm mass. A clotted sample, apparently normal, may yield jellied serum after dissociation of the clot and centrifugalization. In the majority of jellied samples liquid serum is obtained when the blood mass is dissociated and centrifuged. It may be necessary to repeat this procedure several times to obtain liquid serum. Infrequently, the serum in the agglutination tube and rarely the antigen-serum mixture become jellied.

### Preliminary Observations

This investigation was started in September, 1930. Earlier general observations concerned blood samples which were placed in an incubator at approximately 37° C. for 45 to 60 minutes. This exposure of the blood samples to heat either before or after centrifugalization appeared to influence the number of jellied samples.

The following observations were associated with frequent collections of blood samples from 19 birds (10 pullets and 9 cockerels). The birds were housed in a warm room and during the day were placed in a yard when the weather permitted.

1. Jellying appeared in from 0 to 70 per cent of the samples which were exposed to 2° C. immediately after collection and held at this temperature for from 3 to 40 hours.

2. Jellying appeared less frequently when the samples were subjected to a temperature of 10° C. for similar periods of time.

3. Jellying did not appear in the samples which were held at 22° C. for two hours after collection and then placed at 2° C. for varying periods of time.

4. The temperature of the tubes at the time of collection appeared to have no influence upon jellying. Quadruplicate samples were collected. Two warm tubes (approximately 22° C.) and two cold tubes (approximately 2° C.) were used. One warm-tube sample was held at 22° C. and the other at 2° C. The cold-tube samples were handled in the same way.

5. Jellying was slightly less frequent when samples were collected in 11 x 100 mm. tubes than when 8 x 77 mm. tubes were used.

6. Jellying appeared when blood samples were centrifuged immediately after collection.

7. Attempts to produce jellied samples by collecting blood into tubes which had been washed in dilute hydrochloric acid were unsuccessful. The same observation was made when the tubes were washed in sodium hydroxide and incompletely rinsed before use.

8. Blood samples were taken in duplicate while the birds were in the warm room. Half of the samples were placed at a temperature of 0° C. for 1 hour and the other half held at the room temperature. Then all samples were placed in a refrigerator (8° C.) for approximately 24 hours. Jellying occurred among the samples exposed to the lower temperature and did not occur among those exposed to the room temperature.

9. On different occasions, blood samples were taken in duplicate while the birds were in the yard, and when the atmospheric temperatures varied from 1° to 12° C. Half of the samples were placed in the operator's vest pockets and half exposed to the atmospheric temperature during the course of blood collection (approximately 30 minutes). Then the former were held at room temperature, and the latter at the prevailing atmospheric temperature for 1 hour. Finally all samples were placed in a refrigerator (8° C.) for approximately 24 hours. Jellying occurred among the samples exposed to the atmospheric temperatures and did not occur among the samples placed in the operator's vest pockets.

These preliminary observations were made upon a small number of birds maintained at the laboratory. It appeared that certain of these earlier general and preliminary observations should be investigated further. Arrangements were made to do this, both in the field and in the laboratory.

### Experimental Procedure and Results

I. Instructions were given to two blood collectors to place the even numbered samples into their inner pockets for about 30 minutes, and then place them in the containers with the odd numbered samples which were to be handled in the routine manner. Data concerning the observations are presented as follows:

<i>Blood Collector</i>	<i>Number of Samples</i>	<i>Even Samples</i>		<i>Odd Samples</i>	
		<i>Jellied</i>	<i>Per Cent</i>	<i>Jellied</i>	<i>Per Cent</i>
A	4,011	88	4.4	290	14.4
B	3,009	62	4.1	207	13.7



II. An electrically heated water bath was employed to keep the even numbered samples warm for 1 hour. The odd numbered samples were handled in the routine manner. The first two days the temperature of the bath was maintained at 36° to 40° C. Later the temperature was maintained at 27° to 32° C. The temperature in the poultry houses varied from 3° to 14° C. at the time of collection. Among 744 even samples, 4 (0.5 per cent), and among the same number of odd samples, 227 (30.6 per cent), were jellied. It happened that on the same days, the same blood collectors collected 641 other samples which received routine handling, i.e., as the odd samples, and 220 (31.5 per cent) were jellied.

III. An insulated heater, incorporating the principles of a double boiler with hot water as a source of heat, was devised. Alternate samples were placed in this heater at temperatures varying from 21° to 46° C. for periods of 10, 15, 20, 30, and 60 minutes. Among the 1,210 samples placed in the heater 67 (5.49 per cent) were jellied, while among 1,191 samples handled in the routine way 277 (23.25 per cent) were jellied. In general, jellying was markedly reduced in the samples exposed to the higher temperatures. The longer periods of exposure had a like influence. A combination of an optimum temperature and an optimum period of exposure was not determined.

IV. After the clots had been separated, 2,894 samples were divided on the basis of odd and even numbers. The odd samples were centrifuged while the even samples were placed in an incubator (approximately 35° C.) for 1 hour before centrifugalization. There were 185 (12.7 per cent) jellied samples among the odd and 112 (7.7 per cent) among the even samples.

V. Instructions were given to one blood collector to collect approximately 0.5 cc. and approximately 1 cc. in alternate tubes. Among a total of 459 samples which he collected in one day, 70.8 per cent of the small and 55.2 per cent of the large samples were jellied. On another day 500 blood samples were collected in accordance with these same instructions. Among a total of 250 samples, 39.6 per cent of the small and 20.1 per cent of the large were jellied. The other 250 samples of this day's work were placed in an incubator for one hour, just previous to centrifugalization, and 32.1 per cent of the small and 14.1 per cent of the large were jellied.

VI. The even-numbered samples of 2,005 received on the day of collection were held over night at room temperature (22°-25° C.) while the odd samples were held in a refrigerator (8° C.). There were 46 (4.6 per cent) of the odd and 5 (0.5 per cent) of the even samples jellied. There was slight hemolysis in many and marked hemolysis in a few of the samples which were held over night at room temperature.

From September 29 to December 26, 1930, records were kept on 238,860 samples. These samples were collected by sixteen blood collectors and were handled in the laboratory on the day following collection. The number of jellied samples recorded at the time the sera were transferred to the agglutination tubes was 10,886 (4.56 per cent). In individual shipments jellying was recorded in from 0 to 85 per cent of the samples. The correlation between the number of jellied samples and certain temperature ranges is shown in Table 2. The daily mean temperature in Amherst was selected as representative of the State. The mean temperatures were procured from meteorological observations of the Massachusetts Agricultural Experiment Station and divided into six groups. The samples were distributed upon the basis of the temperature of the day on which they were collected.

In 1931, during approximately the same period, records were kept on 270,785 samples. These samples were collected by eleven of the 1930 blood collectors and five men employed for their first season. The only difference in the method of



handling was that on cold days the blood collectors placed the samples in their inner pockets for approximately thirty minutes. The number of jellied samples recorded at the time the sera were transferred to the agglutination tubes was 4,133 (1.53 per cent). The observations for 1931 are also shown in Table 2.

TABLE 2—INFLUENCE OF TEMPERATURE UPON INCIDENCE OF JELLIED BLOOD SAMPLES IN 1930 AND IN 1931

Temperature ° F.	1930			1931		
	Number of Samples	Samples Jellied		Number of Samples	Samples Jellied	
		Number	Per cent		Number	Per cent
10-19.....	9,206	966	10.49			
20-29.....	19,179	1,746	9.10	32,867	756	2.30
30-39.....	91,424	5,757	6.30	32,110	999	3.11
40-49.....	66,659	1,950	2.93	99,360	1,671	1.68
50-59.....	46,853	450	0.96	70,291	631	0.90
60-69.....	5,539	17	0.31	36,157	76	0.21
Totals.....	238,860	10,886	4.56	270,785	4,133	1.53

The occurrence of jelling seems to be associated with the temperature at the time of collection of the blood samples. It is thought that the marked reduction in jellied samples in 1931 can be attributed in part to the difference in the method of handling the samples on the cold days. However, the mean monthly temperatures in Amherst in 1930 were lower than in 1931, as is shown in Table 3, and to this fact part of the reduction is attributed.

TABLE 3—INFLUENCE OF MEAN MONTHLY TEMPERATURES UPON INCIDENCE OF JELLIED SAMPLES IN 1930 AND IN 1931

Month	1930				1931			
	Mean Temp. ° F.	Number of Samples	Jellied Samples		Mean Temp. ° F.	Number of Samples	Jellied Samples	
			Number	Per cent			Number	Per cent
October.....	48.9	102,735	1,994	1.94	53.6	112,509	1,062	0.94
November.....	40.2	82,451	3,794	4.60	44.1	98,379	1,702	1.73
December ....	28.1	53,674	5,098	9.50	31.6	59,897	1,369	2.29
Totals.....		238,860	10,886	4.56		270,785	4,133	1.53

In general, it seemed that the number of jellied samples varied considerably with individual blood collectors in spite of practically uniform equipment and technique. The individual records of the eleven men who collected samples during 1930 and 1931 were assembled and are shown in Table 4.

During 1930, the individual blood collector percentages of jellied samples ranged from 0.9 to 14.0 and in 1931 from 0.002 to 5.36. The records of the blood collectors, with one exception, showed marked decreases in the percentages of jellied samples during the second year. No satisfactory explanation was apparent for blood collector G's increase of 0.31 per cent of jellied samples during the second season.

TABLE 4—THE INCIDENCE OF JELLIED SAMPLES FOR BLOOD COLLECTORS IN 1930 AND IN 1931

Blood Collector	Season	OCTOBER		NOVEMBER		DECEMBER		TOTAL	
		Number Samples	Per cent Jellied	Number Samples	Per Cent Jellied	Number Samples	Per Cent Jellied	Number Samples	Per Cent Jellied
A.....	1930	9,574	2.69	6,629	4.63	5,545	6.19	21,748	4.18
	1931	10,249	1.89	7,556	2.33	3,651	3.48	21,456	2.32
B.....	1930	927	4.10	5,815	2.39	3,317	1.15	10,059	2.14
	1931	3,152	0.00	5,742	0.03	3,617	0.03	12,511	0.002
C.....	1930	1,016	2.66	4,538	12.69	3,334	19.22	8,888	14.00
	1931	7,104	0.45	4,419	1.74	4,204	0.86	15,727	0.92
D.....	1930	7,946	4.66	6,366	6.03	4,762	33.74	19,074	12.38
	1931	1,849	10.38	6,254	3.97	1,702	5.05	9,805	5.36
E.....	1930	10,609	4.39	8,265	9.32	4,285	11.99	23,159	7.56
	1931	9,704	1.42	7,233	1.85	6,216	4.38	23,153	2.35
F.....	1930	9,416	2.75	6,674	13.68	5,948	11.78	22,038	8.50
	1931	8,962	0.17	7,864	1.14	4,220	0.47	21,046	0.59
G.....	1930	10,463	1.21	6,734	1.41	5,911	5.94	23,108	2.48
	1931	10,591	0.55	9,401	3.10	6,930	5.82	26,922	2.79
H.....	1930	11,521	1.42	8,070	2.49	2,875	8.38	22,466	2.70
	1931	8,551	0.20	7,473	1.70	7,812	1.20	23,836	0.94
I.....	1930	10,347	0.57	6,258	0.29	9,399	2.23	26,004	0.90
	1931	10,818	0.09	6,924	0.13	203	0.99	17,945	0.12
J.....	1930	8,249	1.08	4,859	1.79	1,595	8.15	14,703	2.08
	1931	9,093	0.21	7,040	1.28	694	1.73	16,827	0.72
K.....	1930	10,377	1.06	7,751	0.43	4,642	5.51	22,770	1.32
	1931	6,777	0.12	6,218	0.63	5,239	2.67	18,234	1.03

### Discussion

The jelling of blood samples was found to occur with great irregularity. Observations limited to the collection of blood samples from a small number of laboratory birds suggested several possible contributing factors. A chemical investigation of jellied samples was not undertaken. The relationship of feed to jelling was not studied. The effect of the physical condition of birds, at the time of collection of blood, upon jelling was not studied to any great extent. Blood samples from a few laboratory birds which were in a somewhat weakened condition showed a slight tendency to jelly consistently. No healthy individuals appeared to be constant offenders. The extent to which the character and size of the incision may contribute to jelling was not investigated extensively, although they appeared to have some influence. Less jelling was noted in blood samples from chickens than in those from pigeons, pheasants, and guinea fowls. This difference may be associated with the character and size of the incision. The rate of flow of blood from the incised vein is much slower for chickens in general. To what extent generic characteristics may be a contributing factor was not determined.

In the routine collection of blood samples, it appeared that the temperature at the time of collection of samples and the method of handling after collection are important factors. The three methods of applying heat to blood samples, by placing in blood collector's pockets, by using a hot water heater, and by using an electrically heated water bath, assisted in reducing the number of jellied samples. The amount of blood collected had a slight influence on the number of jellied samples, there being less jelling of the larger samples. The difference, however, was not as marked as in the case of the application of heat to the blood samples. Holding blood samples over night at room temperature or placing them in an incubator for one hour at 35° C. reduced the number of jellied samples. Varying degrees of hemolysis occurred in the samples held over night at room tem-

perature. In the routine collection of over 500,000 blood samples during parts of two testing seasons, jellied samples occurred more frequently when the average mean atmospheric temperatures were low. The percentage of jellied samples increased progressively during the months of October, November, and December respectively. This increase in the percentage of jellied samples, when the temperature becomes low, may be associated with the inhibitory influence of cold on the clotting of blood. The individual blood collector appears to be another contributing factor in the jelling of samples. It is not apparent how this influence is exerted, but it may be due to slight individualistic differences in the method of collection.

### Conclusions

1. A jellied condition was produced in chicken blood samples by immediate centrifugalization and by exposure to low temperatures.
2. The atmospheric temperature at the time of collection appeared to be a major factor in the incidence of jellied blood samples of chickens.
3. The application of heat materially reduced the number of jellied samples.
4. The application of heat immediately after collection was found to be more satisfactory for reducing the number of jellied samples than the application of heat at the laboratory 16 to 24 hours later.
5. The individual blood collector was a variable factor in the incidence of jellied samples.
6. The incidence of jellied samples was greater among samples containing 0.5 cc. of blood than among those containing 1 cc.

### NON-INFECTED FEMALES MAY CONTRACT PULLORUM DISEASE THROUGH EATING FRESH EGGS LAID BY INFECTED HENS

The problem of eradication of pullorum disease is most difficult since adult birds may harbor in the ovarian tissue the causative organism which can be transmitted to the progeny by means of the egg. The presence of *S. pullorum* both in fresh and in incubated eggs has been detected by several investigators. Rettger and Stoneburn (72) found the organism in incubated fertile and infertile eggs. Jones (51, 52) isolated *S. pullorum* from incubated eggs and later recovered the organism from fresh eggs laid by hens that had overcome an acute attack of the disease during chickhood. Rettger (75), in an examination of approximately 10,000 eggs, found that *S. pullorum* could be isolated with less difficulty from incubated than from fresh eggs. He advised that in testing for the organism, the entire yolk or a large portion of it be used, or that only eggs which have been incubated for at least five or six days be examined. The organism may even escape detection in eggs that have been retained at ordinary room temperature for two weeks if a large part of the yolk is not examined. Gwatkin (39) found 4.76 per cent among 420 eggs examined infected with *S. pullorum*. Runnels and Van Roekel (82, 83) reported that 14 per cent of 305 eggs contained *S. pullorum*. The percentages of isolations were approximately the same for fresh and incubated eggs. In a later experiment, the organism was recovered from 33.7 per cent of 169 eggs examined. Dearstyne, Kaupp, and Wilfong (23) reported that among 2,706 fresh eggs examined, 10.3 per cent contained the organism. Tittler, Heywang, and Charles (90) found 5.2 per cent of 1,560 eggs infected with *S. pullorum*. The majority of these eggs were incubated at 37° C. for 10 days prior to examination. If this means of dissemination did not exist the malady would not be of such importance, and the task of control and eradication of the disease might be far less difficult.

In addition to the fact that the disease may be transmitted to the progeny by means of the egg, it is known that incubated infective eggs are capable of producing the disease when fed to poultry or to other animals. Jones (53) reported a septicemic outbreak of pullorum disease among adult hens caused by the feeding of incubated eggs that contained *S. pullorum*. Rettger (78) stated that eggs harboring large numbers of the organism produce abnormal conditions when fed to young chicks, adult fowls, young rabbits, guinea pigs, and kittens. Mathews (63) observed field cases where infection was introduced through the feeding of incubated, infertile eggs. He also was able to infect eight pullets by feeding incubated naturally infective eggs. Olney (68) reported a severe outbreak of the disease among adult rabbits as a result of feeding incubated, infertile eggs.

While *S. pullorum* has been isolated from fresh eggs, the possibility of such eggs being infective when eaten by animals has not been definitely established. Van Heelsbergen (91) reports that very often thin-shelled eggs are laid by carriers affected with salpingitis. These carriers do not always lay their eggs in the trap nests, thereby affording other birds an opportunity to pick the shell and eat the infective contents. According to investigations, such eggs are very infectious for adult hens. Other investigations (48, 84, 92) report that fresh eggs laid by infected birds may reproduce the disease when eaten by other birds.

It is known that frequently eggs are laid on the floor and dropping boards. Especially is this true for pullets when they first reach sexual maturity. If the eggs are broken, an opportunity for birds to eat or come into contact with the contents is afforded. Some birds even develop a habit of egg-picking and egg-eating. While field and laboratory observations suggest that pullorum disease may be disseminated in such a manner, experimental evidence has been lacking. Therefore, an investigation was designed to determine whether non-infected females may contract pullorum disease through eating fresh eggs laid by infected hens.

### Procedure

Eighteen birds, free from pullorum disease, were divided into two groups.

In Group A, the birds (5 hens and 7 pullets) were held in individual cages. Their diet consisted of cracked grain, laying mash, and one egg from infected hens a day. Prior to the feeding of the eggs, an effort was made to determine which reacting birds were laying infective eggs. One hundred eggs, laid by 9 birds, were examined bacteriologically for *S. pullorum*. The organism was isolated from eggs laid by all of these birds with the exception of 2. *S. pullorum* was recovered from 12 per cent of the total eggs cultured. Recognizing the fact that the elimination of the organism through the egg is neither constant nor permanent, it was considered advisable to determine the approximate incidence of the organism in the eggs which were to be fed. The initial method of feeding the egg was to break it and place it upon the litter. Since not all birds ate the egg given in this manner, the method of feeding was changed. A broken egg was placed in each feed cup daily. This method also proved unsatisfactory and was further modified. An egg was mixed with sufficient dry mash in the feed cup to make a semi-dry mixture, which was readily eaten by all birds. Cracked grain was added to the diet whenever the egg-mash mixture had been eaten. All birds were fed a minimum of 31 feedings and one received as many as 65. Each bird was tested by the macroscopic tube agglutination method in dilutions of 1:10 and higher at weekly intervals.

The antigen used was a composite of three known agglutinable strains of *S. pullorum*. The organisms were grown on nutrient agar for 72 hours at a temperature of 37° C. The growth was then washed off with phenolated, physiological saline solution and the suspension standardized to a turbidity corresponding

to 0.75-1 on the McFarland nephelometer scale. The pH was adjusted to approximately 8.4.

Group B consisted of 6 pullets, 3 months of age, which were placed together in a pen. Six eggs, mixed with sufficient mash to make a semi-dry mixture, were fed daily. This ration was supplemented with cracked grain when the egg-mash mixture had been eaten. The group was given 30 daily feedings of 6 eggs. The birds were tested at weekly intervals by the tube agglutination method in dilutions of 1:10 and higher. The antigen employed was identical with that used for Group A.

### Results

In Group A, specific agglutinins were detected in 4 birds (2 hens and 2 pullets), as is shown in Table 5. Two birds attained a maximum titer of 1:2,560. Sera of 5 birds produced non-specific agglutination in the lower dilutions. All birds were necropsied approximately one month after the last feeding with the exception of 1 hen. This bird died of a septicemic form of the disease 14 days after the last feeding. In the majority of the birds, cultures were taken for bacteriological determination from pericardial fluid, liver, spleen, ovary, and any suspicious lesions. *S. pullorum* was isolated from the 2 hens, including the fatal septicemic case, whose sera agglutinated pullorum antigen. *S. pullorum* was not isolated from the remaining 10 birds.

In Group B, 18 days after the first feeding, three sera produced a slight agglutination in the lower dilutions and one had a titer of 1:640. Seven days later, these 4 birds had developed titers of 1:160 or higher. As is shown in Table 5, agglutinins were produced in the blood of all birds. In 2 birds the maximum titer was 1:5,120 and in 1 the titer did not exceed the 1:80 dilution. One bird died from an intestinal obstruction and the septicemic form of the disease 25 days after the last feeding. *S. pullorum* was recovered on necropsy. The remaining five birds were necropsied 47 days after the last feeding and *S. pullorum* was recovered from 2. The organisms isolated from the 4 birds in this experiment were identified by morphological, biochemical, tinctorial, and agglutinable characteristics.

### Discussion

According to these observations, it is evident that fresh, naturally infective eggs are capable of reproducing the disease when fed to hens and pullets. Evidence of the disease was detected in 4 of the 12 birds that received individual feedings. The fact that each bird in this group received 1 egg at each feeding rather than a portion of a composite of eggs may account partly for the smaller number of infected birds when compared with Group B. It is possible that the age of the birds and the manner of confinement may be responsible for this difference. The incidence of the organism in the eggs may have been greater in those fed to Group B. Since the smallest number of infective eggs necessary to infect birds by the oral route has not been determined, it appears possible that under a suitable environment 1 fresh infective egg might be capable of reproducing the disease in mature as well as immature birds. If such is the case, then the problem of "egg-eating" is of serious consequence in pullorum disease dissemination, because eggs laid on the floor and dropping boards frequently are broken and eaten by non-infected birds. Of course, not all eggs harbor the organism, but it is likely that some infected birds may lay infective eggs in places other than nests. This means of dissemination can be eliminated to a large extent by testing young birds before they reach sexual maturity. In spite of the fact that all infected birds may not be eliminated at this age, testing at this time does permit one to dispose of the bulk of the potential source of infection.

TABLE 5—DATA CONCERNING BIRDS FED FRESH EGGS LAID BY INFECTED HENS

Group	Bird No.	AGGLUTINATION REACTION			NECROPSY REMARKS			Titer
		Number of Feedings	Maximum Titer	Days after First Feeding	Days after Last Feeding	Tissues Cultured	<i>S. pullorum</i> Isolated	
A	63851	40	2,560	38 & 59	27	Pericardial fluid, liver, spleen, cyst, foreign body in oviduct, ova	Ova	2,560+
	99959	65	P	38 & 73	31	Liver and ovary	Negative	Trace 1-10
	63916	41	P	.....	32	Pericardial fluid, ovary, liver, cyst of breast bone, oviduct	Negative	Negative
	63894	44	P	.....	32	Pericardial fluid, liver, spleen, ovary, abdominal cysts, tumor	Negative	Negative
	63952	52	P	.....	32	Liver, subcutaneous cyst, spleen, ovary	Negative	Partial 1-10
	63934	46	640	55	14	Heart blood, liver, spleen, peritoneum, ovary, cyst in oviduct	Liver, spleen, peritoneum, ovary	Trace 1-20, 1-40
	19881	31	2,560	40, 47 & 54	31	Liver, spleen, abdominal cysts, ovary	Negative	640
	19877	31	P	.....	31	Pericardial fluid, spleen, liver, ovary, abdominal cyst	Negative	Trace 1-10
	19880	31	320	31	33	Pericardial fluid, liver, spleen, ovary, kidney, heart muscle	Negative	80
	19882	31	P	.....	32	Heart blood, liver, spleen, ovary	Negative	Negative
	19878	31	0	.....	33	Heart blood, liver, spleen, ovary, abdominal cyst	Negative	Negative
	19879	31	0	.....	32	Pericardial fluid, liver, spleen, ovary	Negative	Negative
B	207	30	160	25 & 32	47	Pericardial fluid, liver, spleen, ovary	Pericardial fluid, spleen, ovary	40
	235	30	5,120	32 & 39	25	Pericardial fluid, liver, spleen, cyst	Pericardial fluid, spleen, liver	1,280
	232	30	160	39 & 46	47	Pericardial fluid, liver, spleen, ovary	Negative	160
	187	30	5,120	32	47	Pericardial fluid, liver, spleen, ovary	Negative	320
	233	30	640	46-66, inc.	47	Pericardial fluid, liver, spleen, ovary	Ovary	640
	214	30	80	32 & 46	47	Pericardial fluid, liver, spleen, ovary	Negative	10

P—Non-specific agglutination in lower dilutions.

+ Titer not determined.



### Conclusions

1. Fresh eggs, laid by reacting hens, may produce pullorum disease when fed to non-infected hens and pullets.
2. It is probable that younger birds may contract the disease more readily through eating infective eggs than older birds.
3. The habit of "egg-eating" or "egg-picking," in an infected flock, should be regarded as a hazard to an eradication program for such a flock.

### EXPOSURE OF PULLORUM DISEASE-FREE BIRDS TO SOIL AND LITTER CONTAMINATED WITH FECES FROM POSITIVE REACTING BIRDS

The object of the experiment reported in this paper was to determine whether pullorum disease-free birds could be infected through exposure to soil and litter contaminated with feces from positive reacting birds.

From the results reported by several investigators, it can be concluded definitely that pullorum disease does spread through the association of infected with non-infected, sexually mature birds. Rettger, Kirkpatrick, and Stoneburn (74) have reported cross-infection when 7 non-infected hens were penned with 7 infected hens for a period of 2 years. To determine whether a bird became infected or not, all eggs laid by the negative birds were examined for *S. pullorum*. By this method it was determined that 3 of the original non-infected hens had become infected. The same authors also were able to infect non-infected hens by sprinkling a broth culture of *S. pullorum* on the litter two or three times a week. Doyle (27) was unsuccessful in transmitting pullorum disease when 50 positive-reacting hens were housed with 30 non-reacting hens for 1 year. Leynen (59) concluded that the spread of pullorum disease through cohabitation does not occur readily. Brunett (11, 14) after an extensive study concluded that pullorum disease spreads between mature birds but not to as great an extent as is generally believed. He was successful in demonstrating the spread of pullorum disease both in the presence and absence of male birds. Edwards and Hull (31) concluded that the transmission of pullorum disease may occur without the presence of males. Kernkamp (55), from the results of two experiments, concluded that pullorum disease spreads between sexually mature birds. In both of these experiments, male birds were present in the pens. Warrack and Dalling (94, 95), after a series of experiments, made the following conclusion: Transmission of pullorum disease takes place among sexually mature birds and the smaller the space in which birds are penned the greater the chance of transmission taking place. Investigations at the California (16) and Illinois (50) Agricultural Experiment Stations have also shown the transmission of pullorum disease between infected and non-infected adult birds. Kerr (56) reported the isolation of *S. pullorum* from the feces of three adult hens by bacteriological methods. This is the only reference noted in which *S. pullorum* has been isolated from the feces of adult birds.

Although Doyle (27) was unsuccessful in transmitting pullorum disease through the association of infected and non-infected hens, he was successful in transmitting the disease to day-old chicks housed with positive-reacting hens.

Mathews (63) working with day-old chicks and infected hens failed to demonstrate *S. pullorum* in the feces of the infected hens. Fifty day-old chicks were divided into three groups. Group I was fed chick feed containing 5 per cent of fresh feces from 8 positive-reacting hens. Group II was brooded in a pen which communicated with another pen in which there were 3 positive-reacting hens. Chicks mingled with the hens freely. Group III was a control pen. At the end of two to three weeks the chicks were killed and examined bacteriologically for

*S. pullorum* with negative results. This experiment was repeated with 61 chicks in a similar manner with the exception that Group II was brooded by 1 positive-reacting hen. *S. pullorum* was not isolated from these chicks when killed at two to three weeks of age. In a third experiment, 8 hens were fed infective eggs. Three weeks after feeding the eggs, feces were collected from hens and 5 per cent were mixed with the chick feed and fed to 12 day-old chicks with negative results. Weldin and Weaver (97) were successful in isolating *S. pullorum* from feces of infected chicks by bacteriological methods. They also were successful in demonstrating *S. pullorum* in feces from both artificially and naturally infected chicks when feces from infected chicks were collected in tin or cardboard trays, washed off in water, and the suspension added to the drinking water of non-infected chicks. Non-infected chicks also were infected when feces from infected chicks were transferred to the floor of the pen of non-infected chicks. Dalling and Allen (20) recovered *S. pullorum* from 2 of 3 chicks which died after being placed in a box which had been left untouched for 1 month following the death of 2 chicks which had been fed a culture of *S. pullorum*.

In studying the viability of *S. pullorum*, Allen and Jacob (1) were able to recover the organism from soil samples for 10 to 14 months after artificial inoculation. Kerr (56) reports the recovery of *S. pullorum* from fecal emulsions which had been retained for more than three months. The maximum length of time in which he was able to recover the organism was 101 days.

While the results of these investigations would indicate that pullorum disease may be disseminated through the feces, the relative importance of feces as a vehicle of dissemination was not determined. To obtain further information on the importance of feces as a vehicle of dissemination, the following experiments were conducted.

### Procedure

In the first experiment, pullorum disease-free birds were exposed to soil contaminated with feces from positive-reacting hens. Two groups of non-reacting hens were used. Group I (16 R.I.R. and 4 B.P.R. hens) was purchased from a breeder whose flock has been free from pullorum disease, as determined by the tube agglutination test, for 3 consecutive years. Group II (12 R.I.R. hens) was purchased from a breeder whose flock has been free from pullorum disease, as determined by the tube agglutination test, for 7 years. Both groups of birds were tested when received and were negative to the tube agglutination test.

The feces were obtained from a group of positive-reacting hens, isolated in an 8 x 12 foot house, and were collected from the dropping boards once a week. The roosts and dropping boards were screened with wire poultry netting. Two grassed plots of ground (8 x 12 feet) adjoining the house of the same size were used. The plots were not shaded but were entirely open to the sun.

Feces were scattered on Plot I at weekly intervals, beginning April 6, 1931, and continuing until November 17, 1931. The mean average temperatures for the months of April to November, inclusive, procured from the meteorological reports, Massachusetts Agricultural Experiment Station, were as follows:

Month	Mean Average Temperature	Month	Mean Average Temperature
April	46.7° F.	August	69.6° F.
May	58.1°	September	64.8°
June	66.7°	October	53.6°
July	73.1°	November	44.1°

Approximately one-third bushel of feces from the positive-reacting birds was scattered on Plot I each week for 8 weeks. Group I (20 hens) was then



placed in the house and given access to Plot I for 6 weeks. During this time Plot II received the weekly applications of feces in quantities of one-third bushel. The plots were used alternately every 6 weeks, the idle plot receiving weekly applications of feces. Group II (12 hens) was added to the flock 6 weeks after Group I was housed. Group I was exposed to the contaminated soil for 24 weeks and Group II for 18 weeks.

The hens in Groups I and II were tested by the tube agglutination test (in dilutions of 1:10 and higher) at weekly intervals for the first 18 weeks and at biweekly intervals for the remaining 6 weeks. The antigen used was identical with that used for investigation No. 3, (Non-infected females may contract pullorum disease through eating fresh eggs laid by infected hens).

In the second experiment, pullorum disease-free birds were exposed to litter contaminated with feces from positive-reacting hens. Two groups of birds were used. Group I contained 15 pullets, 3 hens, and 1 cockerel. Ten of the fifteen pullets and the one cockerel were purchased as day-old chicks from a breeder whose flock had been free from pullorum disease, as determined by the tube agglutination test, for 1 year. They were tested first when 4 weeks of age and at 2-week intervals thereafter. They were 7½ months old at the beginning of the experiment. The remainder of Group I (5 pullets and 3 hens) were originally obtained from three breeders whose flocks have been negative to the tube agglutination test for 1 or more years. They had been previously used on an experiment unrelated to pullorum disease and had always been negative to the tube agglutination test. Group II (11 hens) was purchased from a breeder whose flock had been negative to the tube agglutination test for 7 years.

An 8 x 12 foot house with a wire sun porch of the same dimensions was used. Clean shavings were used as litter. Hard grain was fed morning and afternoon in the litter. The soiled litter was replaced completely four times with clean shavings. The feces were obtained from the same group of positive reacting hens which was the source of supply in the soil contamination experiment. The duration of the experiment was from December 21, 1931, to April 25, 1932. On six dates the feces were frozen to the dropping boards when collected. The mean average temperatures for the months of December to April, inclusive, were as follows:

<i>Month</i>	<i>Mean Average Temperature</i>
December.....	31.6° F.
January.....	33.5°
February.....	26.3°
March.....	31.9°
April.....	44.4°

The coldest month was February, when the minimum morning temperature reached during the month was +3° F. and the maximum morning temperature was 34° F.

After the birds in Group I were placed in the house, approximately one-quarter bushel of feces from the positive-reacting birds was added to the litter. Then feces were added at weekly intervals for 12 weeks. At the end of the twelfth week, Group II was added and the feces were applied to the litter daily, in quantities of one to two quarts for 5 weeks. Then the experiment was terminated, due to an outbreak of laryngotracheitis in these birds.

The birds were tested by the tube agglutination test (in dilutions of 1:10 and higher) at biweekly intervals. The antigen was identical to that used in the soil contamination experiment.

### Results

All birds in both experiments remained negative to the tube agglutination test.

The 62 birds (16 died during the course of the two experiments) were necropsied and *S. pullorum* was not isolated on necropsy.

### Conclusion

While the number of birds was small and the duration of the experiment was not sufficient to show definitely that pullorum disease is not spread through the feces from infected hens, the results obtained would suggest that feces from infected hens are not an important vehicle of transmission to older birds.

### DISSEMINATION OF *S. pullorum* INFECTION AMONG SEXUALLY IMMATURE FEMALES

Pullorum disease dissemination is a problem of great import in establishing and maintaining pullorum disease-free flocks. Investigations have shown that there are various modes of dissemination of the disease during the different ages of a bird's life. The disease may spread readily among young chicks while affected with an acute form of the disease. The causative agent has been recovered from the feces of infected chicks. Rettger (70) isolated *S. pullorum* from the feces of 2- to 3-weeks-old chicks which were artificially infected. Jones (51) observed that non-infected chicks, (24 to 48 hours old), placed in a brooder previously occupied by infected chicks would contract the disease. Chicks revealed the greatest susceptibility to infection during the first 24 hours of life. The possibilities of infection seemed to decrease as the chicks became older. Rettger and Stoneburn (73) stated that the disease may be spread by infected feed and water, hence normal chicks may acquire it by picking up contaminated feed and droppings. Doyle (27) found that day-old chicks housed with infected hens contracted the disease. Control chicks from the same hatch remained healthy for 1 month when the experiment was discontinued. Mathews (63) found that chicks (24 hours old) fed feces from infected hens, as well as chicks placed in contact with infected hens had not contracted the disease at 2 to 3 weeks of age. Mallman (61) reported that the examination of intestinal contents of chicks as a supplementary procedure to the culture of other organs increased the number of positive cases of *S. pullorum* 10 per cent. Emmel (34, 35) was able to isolate *S. pullorum* from the intestinal contents of naturally infected chicks. He found in 15 chicks which survived an attack of pullorum disease that *S. pullorum* persisted in the feces of 13 chicks for 1 week, 8 chicks for 2 weeks, 3 chicks for 3 weeks, and 1 chick for 5 weeks after the climax of the outbreak. Kerr (56) made emulsions from fecal specimens collected from natural outbreaks of disease and recovered *S. pullorum*. The organism was found to remain viable in the specimens for a period of 101 days. Weldin and Weaver (97) were able to transmit the disease to healthy chicks by placing them in contact with feces from infected chicks. Healthy chicks also contracted the disease when placed in contaminated pens, when placed with diseased chicks, and when placed in pens adjoining those containing infected chicks.

It is also known that the disease may spread among infected and non-infected adults through indirect or direct contact. Rettger, Kirkpatrick, and Stoneburn (74) observed transmission of the disease when hens that had laid infective eggs were placed among hens that did not reveal any evidence of infection according to the flock history and examination of their eggs. Doyle (27) found that the disease was not transmitted from 50 naturally infected birds to 30 healthy birds

during a period of 12 months. The birds were maintained in small houses which were cleaned out at long intervals so as to allow every opportunity of infection taking place. Edwards and Hull (30) observed that the disease may spread from infected to non-infected hens without the presence of male birds. Monthly agglutination tests extending over a period of a year revealed reactors at the third, seventh, eighth, and tenth months. Brunett (13, 14) found that the disease was not transmitted from infected to non-infected hens during a period of 7 months' contact. After the addition of 3 non-reacting mature male birds, a number of non-reacting hens became reactors. Later he observed that among 13 reacting birds and 12 non-reacting birds with 2 non-reacting males, no evidence of transmission of the infection was obtained for a period of 9 months. However, among 14 reactors and 14 non-reactors without males being present, the infection was found to have spread to 1 bird during a period of 9 months. Beach and Michael (3) reported that among 37 non-reacting hens kept in a pen with 61 reacting hens for 19 months, 12 became reactors. Kernkamp (55) found that 11 of 24 negative hens developed positive agglutination reactions while in contact with infected birds for a period of approximately 13 months. In another experiment, 8 of 17 negative hens became positive while in contact with infected birds for 9 months. *S. pullorum* was isolated from 24 per cent of the birds that were non-reacting at the beginning of the contact period. Warrack and Dalling (94) observed in an experiment of 18 weeks' duration that transmission of pullorum disease occurred among adult stock between reactors and non-reactors. Furthermore, the smaller the space in which fowls are confined, the greater is the chance of such transmission taking place.

The presence of the organism in the intestinal and reproductive tracts of infected adult birds has been observed. Kerr (56) isolated *S. pullorum* from the feces of adult birds. Miessner (65) reported that Ansorg and others observed the presence of *S. pullorum* in the cloacae of hens. Lesbouyries (58) stated that it is probable that adult birds become infected through contaminated droppings, in places where trap nests are not employed, by feed containing a debris of shells, and through feed contaminated with *S. pullorum*.

Known non-infected birds may contract the disease by eating fresh or incubated eggs laid by infected hens. Rettger and Stoneburn (72, 74) isolated *S. pullorum* from incubated infertile and fertile eggs. The organism was also recovered from fresh eggs. Jones (52, 53) was successful in isolating the organism from fresh eggs laid by fowls that had overcome the disease during chickhood. He also observed an outbreak of the disease in an acute form in adult fowls caused by the feeding of incubated eggs that contained *S. pullorum*. Mathews (63) observed an outbreak of infection in a flock as a result of feeding incubated, infertile eggs. He succeeded in bringing about infection in pullets by feeding incubated eggs laid by infected hens. Van Heelsbergen (91) reported that an important channel of pullorum disease dissemination is through so-called "egg-picking." In another part of this bulletin an investigation is reported which shows that non-infected females may contract pullorum disease through eating fresh eggs laid by infected hens.

Experimental findings concerning transmission of the disease among sexually immature pullets have not been found in our review of the literature. Pullets that had not attained egg production were regarded as sexually immature. Since a knowledge relating to the dissemination of the infection during this age might be of value in the control and eradication of the disease, the following problem was regarded worthy of investigation.

Can sexually immature pullets infected with *S. pullorum* transmit the infective agent to non-infected pullets when both groups are maintained in close contact?

### Procedure of the Experiment

Twenty-four Rhode Island Red pullets (9 to 13 weeks of age) that reacted positively to the tube agglutination method were placed in contact with twenty-four Rhode Island Red pullets (8 weeks old) that were purchased from a pullorum disease-free flock and that were negative to the tube agglutination test. The birds were placed in an 8 x 12 foot house and provided with a grass range (size 30 x 40 feet). The house and range had not been employed previously for infected stock. All birds were tested at weekly intervals with the tube agglutination method in 1:10, 1:20, and higher dilutions. The antigen employed was identical with that used for Investigation No. 3. The positive reacting pullets were removed from the flock when they approached sexual maturity in order to eliminate the possibility of infective material (eggs and degenerated ova) playing a role in dissemination.

After the sixty-sixth day of the experiment, the birds had access to the range only 2 days a week, due to lack of green grass. A screen porch (8 x 12 feet) was provided for the birds when they did not have access to the range. On the sixty-ninth day one of the non-reacting pullets affected with subcutaneous emphysema was removed from the flock for treatment. This bird was retained in a cage by itself and returned to the flock after being in isolation for a period of 3 weeks.

The positive reacting pullets remained with the flock as follows: 3 for 62 days; 2 for 84 days; 3 for 105 days; and the remaining 13 for 111 days. Two positive pullets that revealed symptoms of depression, anorexia, and emaciation were necropsied on the sixty-fourth day. *S. pullorum* was isolated from the pericardial fluid, liver, spleen, and peritoneum of 1 of these birds. One positive pullet became paralyzed, was necropsied on the seventy-seventh day, and *S. pullorum* was not isolated.

The experiment extended from June 10 to December 28, 1931, inclusive. The non-reacting pullets remained negative for 111 days while in contact with the reactors and for 91 days after the positive birds had been removed. All but 2 of the non-reacting pullets had laid at the end of the experiment. One non-reacting bird was necropsied 21 days after the reactors were removed. Death was due to acute peritonitis caused by foreign material escaping through a perforation in the wall of the proventriculus.

Table 6 shows the weekly agglutination titers of the reacting pullets during the course of the experiment. The titers of the majority of the birds decreased during the course of the experiment. Thirteen birds had titers of 1:160 or higher at the time they were removed from the non-reacting birds. In a few instances, the titers fluctuated markedly during the period of observation.

### Discussion

According to these findings, pullorum disease did not spread among infected and non-infected sexually immature pullets while maintained in close contact. Whether these observations approximate those which one might find among practical conditions has not been determined. The results indicate that the organism either was not eliminated by the infected birds or not eliminated in sufficient numbers to produce infection in the susceptible birds maintained under the conditions described. The presence of certain factors such as management and sanitation might exert a favorable influence on the spread of the disease. Perhaps the number of birds employed, the duration of the contact, and the post-contact periods might be influencing factors in bringing about transmission of the disease. These results are not regarded as conclusive and this problem is worthy of further consideration.

TABLE 6—AGGLUTINATION RECORD OF THE POSITIVE BIRDS AND PERIOD OF CONTACT WITH THE NON-REACTING GROUP

Bird No.	Dates of Tests and Agglutination Titers																No. Days with Non-Reacting Pullets	
	6/4	6/11	6/19	6/29	7/6	7/13	7/20	7/27	8/3	8/10	8/17	8/24	8/31	9/8	9/14	9/21		9/28
20887	100	80	160	80	80	40	10	10	0	0								62
20891	200	160	320	160	160	320	80	160	80	80								62
20897	50	320	40	40	80	80	40	40	40	40	40	40						77
20898	200	40	160	160	160	640P	320	160	160	160								64
20902	50	80	160	80	160	320	320	160	80	160	160	160	320	80	80	80	80	111
20904	100	320	320	320	160	320	80	160	80	80	160	160	160	80	80	80	80	111
20905	400P	5,120P	5,120	2,560	1,280	5,120P	1,280	640	640	160								64
20909	200	320	320	320	160	320	80	160	80	80	80	80	80	80	80	40	40	111
20912	100	320	640	640	320	1,280	640	640	320	320	160	320	640	320	320	320	640	111
20913	200	320	640	640	640	1,280	640	1,280	640	640	640	640	1,280	320	320	640	1,280	111
20915	100	320	320	320	160	160	40	160	320	NT	320	320	640	320	640	1,280	1,280	111
20916	400P	640	1,280	640	640	2,560P	320	320	160	160	160	160	320	160	160	160	160	111
20918	100	80	160	160	80	160	20	40	40	40	20	40	40	40	40	40	40	111
20919	100	320	160	320	160	320	160P	160P	160	40	40	80	80	80	80	80	80	105
20920	100	320	320	160	160	160	160	640P	320	320	320	320	320	160	160	160	160	83
20925	50	160	160	160	160	320	160	160	80	160	80	160	160	160	160	160	160	111
20926	50	80	160	80	40	80	40	40	40	40	40	80	160	160	160	160	160	111
20932	100	160	320	320	320	1,280P	320	160	160	160	20	20	20	20	20	20	40	62
20933	100	160	160	160	160	80	20	20	20	20	20	20	20	20	20	40	105	
20934	50	40	40	40	40	40	0	10	10	10	10	20	20	10	10	10	20	111
20935	50	40	80	80	80	80	40	40	20	320	320	320	640	160	320	320	320	111
20936	400P	320	320	320	640	640	80	80	80	40P	40	40	40	20	40	20	20	105
20938	400P	320	640	1,280	1,280	1,280	320	320	160	320	160	160	160	160	160	80	80	83
20945	200	160	640	640	320	320	160	80	80	80	160	160	160	160	80	80	160	111

P—Titer not determined.

NT—No test.



### Conclusions

1. Transmission of pullorum disease did not occur among sexually immature, reacting and non-reacting pullets while in contact for 111 days, as determined by the macroscopic tube agglutination test.
2. The serum titers of the majority of positive reacting birds decreased during the course of the experiment.
3. Fluctuation of serum titers was observed in some birds.

### PATHOGENICITY OF *S. pullorum* IN RELATION TO AVES OTHER THAN CHICKENS

Pullorum disease has been reported as prevalent throughout the different continents wherever the domestic chicken is maintained. The disease is particularly prevalent in sections where there has been much traffic of poultry and where no progress has been made in its control and eradication. While the domestic chicken is regarded as the optimum host of this disease, other animals cannot be disregarded as to their relation to the causative agent. Investigators who have concerned themselves with this disease have confined their work largely to chickens. Rettger, Hull, and Sturges (77) reported the organism to be pathogenic for cats, guinea pigs, and highly so for rabbits. They found that rats were not affected. Mulsow (66) found that mature and immature rabbits, kittens, mice, rats, cats, sparrows, squabs (less than 48 hours old) and adult pigeons when fed the organism manifested no symptoms of the disease. Cats fed infected sparrows and rabbits that had died from an infection with *S. pullorum* manifested no symptoms of the disease. Mice, guinea pigs, rabbits, and sparrows inoculated intraperitoneally would in some cases succumb to the disease. The organism appeared to be highly pathogenic for sparrows. Pigeons and rats were quite resistant to the organism.

In England, Doyle (27) reported that guinea pigs are susceptible to subcutaneous and intraperitoneal inoculations, whereas ducks of all ages and by all routes are insusceptible. Rabbits were found to be very susceptible. Instillation of three drops of broth culture into the eye proved fatal. A sheep administered dead and live cultures manifested no symptoms. In Germany, Beck and Eber (4) found rabbits, mice, and canary birds to be susceptible to the disease by artificial exposure. Canary birds were found susceptible to both subcutaneous inoculation and feeding of the organism. Guinea pigs fed the organism remained healthy.

The Rhode Island Agricultural Experiment Station (80) reported an experiment on the control of blackhead in turkeys in which a heavy mortality occurred that was considered apparently due to bacillary white diarrhea. It was not stated whether the diagnosis was confirmed by bacteriological findings. A natural outbreak of the disease among domestic rabbits was reported by Olney (68). Infertile eggs, incubated for 18 days, were received from a commercial hatchery. The eggs were mixed with the mash. The disease did not manifest itself in the sucklings. A mortality of 125 among 128 rabbits was encountered. *S. pullorum* was isolated from seven rabbits examined. Hewitt (45) isolated *S. pullorum* from two turkey poults that had been hatched in an incubator previously occupied by chicks.

In Switzerland, Galli-Valerio (37) encountered a grave disease among a flock of pheasants (*Phasianus colchicus*) which he designated as white diarrhea. Low hatchability and mortality were associated with the malady. The clinical and pathologic-anatomical pictures resembled pullorum disease. The morphological and cultural characteristics of the organism isolated from the dead embryos and

chicks were identical with those of *S. pullorum*, except the organism was capable of producing indol. Carbohydrate fermentation reactions were not reported. Three adult pheasants from the infected flock were tested by the agglutination test employing an antigen containing the isolated organism. The antigen was agglutinated in a dilution of 1:25. One serum possessed a stronger titer than the other two. An organism identical to the one isolated from the embryos and chicks was recovered from the ovary of the pheasant which possessed the strongest titer. The author was of the opinion that *S. pullorum* presents a series of varieties in relation with the different avian families in which it may occur; therefore he named it *B. pullorum* var. *phasiani*.

Dalling, Mason, and Gordon (21) reported natural infection of disease among sparrows in England. Among sparrows, received from poultrymen whose chicks were affected with disease, three were found infected with *S. pullorum*. The sparrows were caught in the chicken run. The isolated organism was typical of *S. pullorum* in every respect. In Germany, Lerche (57) observed a natural outbreak of pullorum disease in two different flocks of ducklings. In the first flock the ducklings had been purchased from a hatchery. In the second flock, the ducklings were hatched in a small incubator. Hatchability and livability were affected. In earlier years losses had not occurred among the ducks. In the second flock, chicks were also affected. Necropsy and bacteriological examination of the ducklings and chicks revealed *S. pullorum* infection. The adult breeding stock (both ducks and chickens) when tested with the agglutination test revealed reactors. In England, Dalling, Mason, and Gordon (22) isolated *S. pullorum* from one of two turkey poults submitted to the laboratory for diagnostic purposes. The specimens were received from a small poultry plant where the turkeys were hatched under hens and had runs in common with the chicks. No definite evidence of pullorum disease existed on the premises, although the losses among the chicks were suggestive of the presence of this infection.

Hudson and Beaudette (49) reported the isolation of *S. pullorum* from a European bullfinch (*Pyrrhula europa*). Van Heelsbergen (91) reports that a disease among pigeons has been observed which corresponds to pullorum disease in chickens. Also in a few cases, *S. pullorum* has been found in sparrows, and their possible role in dissemination of the disease should not be excluded. Emmel (33) found pullorum disease in poults from three turkey flocks, of which two flocks had contact with infected chicks. No history concerning the third flock was obtained. Kerr (56) isolated *S. pullorum* from the liver and feces of turkey chicks. In Germany, Miessner (65) reported that the disease was observed in his investigations among ducklings, goslings, and turkey and pheasant chicks. Brunett (12) found 8 reactors among 151 adult turkeys. *S. pullorum* was isolated from 1 of 5 reactors necropsied. No reactors were detected among chickens on the same farm. Hendrickson and Hilbert (43, 44) reported outbreaks of the disease among turkey poults and pheasant chicks. The sources of infection were not definitely determined. The turkey poults which survived the acute attack of the disease were tested later and reactors were detected. Approximately, a 30 per cent mortality occurred among 575 pheasants hatched. The authors were unable to follow up these two cases due to unfavorable field conditions.

The Massachusetts Agricultural Experiment Station (47, 48, 92, 93) reports the testing of 3,021 blood samples, collected from ducks, geese, guinea fowl, jungle fowl, pheasants, pigeons, starlings, and turkeys. These birds represented a large number of farms where either infected or non-infected chickens were maintained. Three reactors were detected among the turkeys, but necropsy findings were negative. One reactor was detected among the guinea fowl, but the bird was not necropsied. No reactors were detected among the other species tested.

In Finland, Stenius (87) stated that ducklings are susceptible to the disease, while geese are believed to be immune. Whether or not mature ducks could be infected was not determined. Rabbits and guinea pigs could be easily infected when inoculated. Beach (2) reports the isolation of *S. pullorum* from turkeys, but considers the disease uncommon among this species.

While it is recognized that pullorum disease does occur among animals other than chickens, some disagreement appears to exist among the observations reported. Unfortunately, in a number of instances the information was too incomplete to determine definitely the origin of the infection. It is hoped that persons working with avian diseases will make every effort possible to determine the origin, clinical features, pathological changes, and the identity of the cause in cases that resemble pullorum disease in animals other than chickens. More information on the disease concerning susceptible hosts would be of value in its control and eradication because frequently species of fowl other than chickens are found on the same premises with the chickens. Also there appears to be a growing interest in pigeon, turkey, and game bird raising. Methods of management employed in poultry husbandry are being adapted to turkey and game bird raising. Therefore, if the pathogenicity of the organism is of some consequence in turkeys and game birds, artificial incubation and brooding and breeding on a large scale may be influencing factors in precipitating the disease which may lead to great losses.

In an effort to obtain additional information concerning birds other than chickens, the investigations have been confined to adult stock almost entirely. The birds employed were as follows: guinea fowl, pheasant, pigeon, and sparrow. The results of the investigation for each group will be discussed in the order listed.

### Guinea Fowl

Twelve guinea fowl (Pearl variety) from one to two years of age were divided into two groups. Group I consisted of 6 males and Group II, of 6 females. Each bird was placed in a separate cage. All birds were tested with the tube agglutination method and were found negative for pullorum disease.

Group I was divided into four lots, the first three of which were exposed to an infective agent which consisted of a saline suspension of *S. pullorum* prepared from a 24-hour agar slant culture, with a turbidity equal to tube No. 1 of the McFarland nephelometer scale. The first exposure was on February 19, and each bird received 15 consecutive daily doses. Each bird in the different lots was exposed as follows: Lot A (2 birds, Nos. 948 and 949) was exposed by instilling 2 drops (approximately 0.03 cc.) of a suspension into the eye; Lot B (2 birds, Nos. 951 and 952) was inoculated intraperitoneally with 1 cc. of the suspension; Lot C (1 bird, No. 950) was fed 5 cc. of the suspension by introducing a pipette well into the esophagus; and Lot D (1 bird, No. 953) was retained as a control.

No external abnormal manifestations were observed during the period of the exposure. All birds were tested in dilutions of 1:10 and higher by the tube agglutination test at frequent intervals. The antigen employed for this and succeeding experiments was identical with that used for Investigation No. 3. Table 7 shows that no agglutinins were detected 4 days after the first exposure. The next test was made 3 days later, and agglutination titers were observed in sera from 2 birds inoculated intraperitoneally and from 1 infected through the ocular route. Ten days after the first exposure, all birds revealed a titer. The maximum titers were attained at approximately 3 weeks after the first exposure, while from then on the titers gradually decreased. The bird which was exposed to the organism by oral administration possessed the lowest titer. Considerable difficulty was encountered with sera becoming jellied. Towards the latter part



TABLE 7—AGGLUTINATION TITERS AND NECROPSIES FOR GUINEA FOWL (GROUP I)

[illegible]

P—Titer not determined.

J—Serum jellied.

U—Test unsatisfactory.

TABLE 8—AGGLUTINATION TITERS AND NECROPSIES FOR GUINEA FOWL (GROUP II)

Bird No.	Date of Tests and Agglutination Titers															Titer at Necropsy	Date of Necropsy	<i>S. pullorum</i> Isolated
	3/24	3/28	3/31	4/4	4/7	4/11	4/18	4/25	5/2	5/9	5/16	5/23	5/31	6/6	6/13			
954	0	0	10	2,560	10,240	320	U	320	160	160	40	40	10	20	20	40	6/17	—
955	0	0	10	320	1,280	80	J	20	20	10	10	20	20	10	20	40	6/17	—
956	0	10?	20	160	320	J	J	20	20	10	0	0	0	0	0	10	6/17	—
957	0	0	10	640	1,280	2,560	20,480	2,560	5,120	10,240	5,120	2,560	2,560	1,280	1,280	2,560	6/17	—
958	0	0	10	20	40	J	J	0	10	0	0	0	0	0	0	10	6/17	—
959	J	0	0	40	320	40	5,120	320	160	80	80	160	160	80	80	160	6/17	+

?—Doubtful agglutination.

J—Serum jellied.

U—Test unsatisfactory.

of the experiment, the difficulty was partly removed by collecting the blood samples in tubes containing sodium citrate solution.

On the seventeenth day of the experiment, one bird, infected through the ocular route, displayed inappetence. On the succeeding day, somnolence, marked depression and weakness were displayed, which were followed by death. Necropsy revealed pneumatic lungs, slightly enlarged and firm liver, enlarged and friable spleen, and extensive acute enteritis, with which was associated a very offensive odor. *S. pullorum* was recovered from the heart blood, liver, spleen, lungs, duodenum, and peritoneum. This strain as well as other strains isolated in these experiments was identified by morphological, biochemical, tinctorial, and serological characteristics. The serum titer extended beyond the dilution of 1:327,680.

The remaining birds were killed and necropsied 17 weeks after the first exposure. Culture material was taken from the following organs or tissues: pericardial fluid, liver, bile, spleen, testes, peritoneum, and intestine. No gross lesions were observed and *S. pullorum* was not isolated.

Group II was divided into three lots. An infective agent prepared from the same strain of *S. pullorum* and in the same manner as that used in Group I was employed. The first exposure was on March 25. Each bird received 15 consecutive daily doses, as follows: Lot A (3 birds, Nos. 954, 955, and 956) was fed 5 cc. with a pipette, which was inserted into the esophagus; Lot B (1 bird, No. 957) was inoculated intraperitoneally with 1 cc. of the suspension; and Lot C (2 birds, Nos. 958 and 959) was exposed by instilling 2 drops, approximately 0.03 cc., of a suspension into the eye. No clinical manifestations were observed at any time during the experiment. All birds were tested in dilutions of 1:10 and higher by the tube agglutination test at frequent intervals. Table 8 shows that doubtful agglutination was observed in 1 bird on the third day after exposure, and on the sixth day all but 1 bird possessed specific agglutinins. Approximately 3 weeks after the first exposure, the birds were placed together in a house (8 x 12 feet in size) which was provided with a screen porch of similar size. An effort was made to produce a favorable environment, which would stimulate egg production. Furthermore, if eggs were obtained they were to be subjected to bacteriological examination in order to determine whether the organism was being eliminated by reacting birds. Unfortunately, no eggs were laid during the course of the experiment, although at the time of necropsy a few birds showed ovarian development.

Jellied blood samples were encountered and the difficulty was corrected in the same manner as in Group I. The agglutination titers in the majority of cases attained their peak between the third and fourth weeks after the first exposure. From then on to the termination of the experiment, a rapid diminution in titers was observed in all but 1 bird which was inoculated by the intraperitoneal method. All birds were killed and necropsied approximately 12 weeks after the first exposure. Culture material was selected from the pericardial fluid, liver, bile, spleen, peritoneum, ovary, oviduct, and intestine. No significant lesions were found except in bird 959, which had one hemorrhagic ovule and yolk material in the abdominal cavity. *S. pullorum* was isolated from the yolk material and ovary. The organism was not isolated from the other 5 birds.

### Pheasant

Twelve female pheasants, (*Phasianus torquatus*) one and two years old, were employed. Each bird was placed in a separate cage. All birds were found negative to the tube agglutination test. The infective agent used contained the same strain and was prepared at the same time and in the same manner as that employed for the guinea fowl in Group II. The birds were divided into four groups and each bird was exposed as follows: Group I (4 birds, 29, 31, 35, and 39) was

inoculated intraperitoneally with 1 cc. of the suspension; Group II (3 birds, 37, 38, and 40) was fed 5 cc. of the suspension by introducing the pipette well into the esophagus; Group III (4 birds, 30, 32, 34, and 36) was exposed by instilling two drops, 0.03 cc., into one eye; Group IV consisted of 1 bird, No. 33, which was regarded as a control. The first exposure was on March 24, and 15 daily consecutive doses were given. Agglutination tests, in dilutions of 1:10 and higher, were made at frequent intervals. Dilutions of 1:10 and higher were employed to determine the titer. Agglutinins were detected on the fourth day after the first exposure, and on the eleventh day all birds possessed agglutinins. The titers in some birds of Group II and III showed a rapid diminution after the third week. It appeared that the organism used as the infective agent had lost some of its virulence since it had been transferred daily for a period of time. On May 26, 4 birds (30, 34, 37, and 40) were given a second series of exposures. Each bird received 10 consecutive daily inoculations by the intraperitoneal method. A strain which was isolated from guinea fowl 949 and which was not subjected to frequent transfers was employed. The suspension was prepared in the same manner as reported earlier. All birds exposed for the second time showed a marked response in agglutinin production. No clinical manifestations as a result of inoculation were observed during the experiment. However, on May 31, bird 39 displayed mild but typical symptoms of laryngotracheitis. The diagnosis was confirmed by inoculation of susceptible chicks which showed a mild form of the disease, and shortly after recovery Dr. C. S. Gibbs of this Station found these chicks to be refractory to large doses of the pathogenic virus. Table 9 shows that a rise in titer of bird 39 occurred following the attack of laryngotracheitis. The control bird, No. 33, revealed slight agglutination in the lower dilutions on four different tests, but this was regarded as non-specific agglutination. Jellyed samples also caused trouble at times, but they were almost entirely eliminated towards the end by use of sodium citrate solution.

Since the birds were maintained under such close confinement and unnatural conditions one was led to suspect that they would not lay eggs. However, on April 18, as Table 10 shows, the first egg was laid and on May 21, all but three birds had attained production. The total number of eggs recorded was 171, and of this number 148 were examined bacteriologically. Some eggs were broken and were unfit for examination. The technique in culturing the eggs was as follows: The fresh eggs were placed at 37° C. for 7 days. Then the eggs were bathed in a beaker containing 5 per cent phenol for approximately 5 minutes. In removing the eggs from the container, the excess fluid was shaken off and care was exercised not to touch the small end of the egg. This end was heated in the flame and opened with a sterile forceps. The egg was then inverted on the mouth of the bottle containing approximately 50 cc. of sterile broth. The broth and egg contents were mixed thoroughly and incubated at 37° C. for 6 days. Transfers were made to tubes of broth on the second, fourth, and sixth days. Only growth that resembled *S. pullorum* was tested for its biochemical, tinctorial, and agglutinable characteristics. Four eggs from two birds were found infected. Bird 30 did not lay infective eggs until after it had received a second exposure. The last egg from which the organism was isolated was laid on July 10, five weeks after the last exposure. It appears that the infection in the egg was the result of established systemic infection rather than an elimination of the inoculated suspension from the peritoneal cavity by way of the oviduct. The infective egg accounted to bird No. 29 was laid on June 4. The percentage (2.7) of infective eggs detected is very small as compared to percentages commonly found among eggs from reacting chickens. However, even though careful technique was employed in the culture work, it may be possible that infection in some eggs escaped our attention.

TABLE 9—AGGLUTINATION TITERS AND NECROPSIES FOR PHEASANTS (GROUPS I, II, III, AND IV)

Group		Bird No.	Dates of Tests and Agglutination Titers																			Tier at Necropsy	Date of Necropsy	S. pullorum Isolated
			3/22	3/28	3/31	4/4	4/7	4/11	4/18	4/25	5/2	5/9	5/16	5/23	5/31	6/6	6/13	6/20	6/27	7/5	7/11			
I	29	0	320	5,120	2,560	2,560	5,120	1,280	J	J	1,280	1,280	1,280	1,280	1,280	1,280	1,280	2,560	2,560	1,280	640	7/20	+	
	31	0	20	640	5,120	10,240	5,120	1,280	160	320	1,280	1,280	1,280	640	160	320	640	320	320	160	320	7/20	+	
	35	0	10?	160P	320	1,280	640	640	160	640P	160	320	J	80	160	80	160	80	160	160	160	7/21	+	
	39	0	2,560	5,120	2,560	2,560	2,560	2,560	640	1,280	2,560	10,240P	10,240	5,120	320	20,480	1,280	2,560	5,120	5,120	1,280	7/21	+	
II	37	0	0	320	320	320	40	10	10	0	10	0	0	160	20,480P	5,120	10,240	2,560	1,280	1,280	1,280	7/19	+	
	38	0	10	5,120	5,120	10,240	1,280	640	80	80	80	80	80	40	40	20	40	20	20	40	0	7/20	+	
	40	0	10	10,240	5,120	5,120	320	160	80	40	10	10	J	40	20,480P	640	5,120	5,120	5,120	2,560	1,280	7/19	+	
III	30	0	0	0	20	160	40	40	20	0	10	0	0	0	2,560	2,560	10,240	10,240	20,480	5,120	5,120	7/19	+	
	32	0	0	160	2,560	10,240	2,560	640	320	80	160	160	J	160	160	80	80	80	80	80	40	7/20	+	
	34	0	10?	1,280	2,560	2,560	160	40	20	20	10	0	10	80	5,120	640	640	640	320	320	320	7/19	+	
	36	J	J	J	160	1,280	320	J	80	J	320	160	160	80	40	J	10	10	10	20	0	7/21	+	
IV	33	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	10	10	10	0	0	7/19	+	

?—Doubtful agglutination

P—Titer not determined.

J—Serum jellied.

The birds were killed and necropsied approximately 17 weeks after the first exposure. Culture material was taken from the following organs or tissues: pericardial fluid, liver, bile, spleen, peritoneum, ovary, and intestine. In some cases material was collected from the oviduct. Any other suspicious lesions were subjected to culture. Necropsy revealed characteristic gross lesions of pullorum disease in birds 29, 31, and 39 of Group I. The lesions were confined chiefly to the ovary and peritoneum. In bird No. 39, considerable encapsulated yolk material was present in the abdominal cavity. Small pieces of yolk were present in the anterior portion of the oviduct. *S. pullorum* was recovered from the peritoneum and ovary in bird No. 29, from an external abdominal abscess in bird No. 31, and from desiccated yolk in the abdominal cavity, yolk in the oviduct, and ovary in bird No. 39. Bird No. 35 did not reveal gross lesions and *S. pullorum* was not recovered.

In birds of Group II, characteristic lesions were observed only in bird No. 40. *S. pullorum* was recovered from an external abdominal cyst near site of inoculation in bird No. 37 and from the spleen, bile, and peritoneum in bird No. 40. No gross lesions were observed in No. 38 and *S. pullorum* was not isolated.

In Group III only 1 bird, No. 30, revealed characteristic gross lesions of the disease. *S. pullorum* was recovered in this bird from the liver, peritoneum, and ovary. Neither significant gross lesions were observed in birds 32, 34, and 36, nor was *S. pullorum* isolated.

In Group IV, bird No. 33 revealed no gross lesions and *S. pullorum* was not isolated.

TABLE 10—DATA CONCERNING EGGS LAID BY PHEASANTS

Bird No.	Number of Eggs Laid	Date Laid		Number of Eggs Cultured	Number of Eggs Found Infective
		First Egg	Last Egg		
29	6	5/21	6/7	6	1
30	38	4/20	7/10	38	3
31	20	5/2	7/18	17	0
32	27	5/6	7/3	24	0
33	7	5/4	7/11	7	0
34	Did not lay				
35	26	5/3	7/21	10	0
36	Did not lay				
37	3	5/10	5/20	3	0
38	35	4/18	7/7	34	0
39	Did not lay				
40	9	5/11	5/31	9	0
Totals	171			148	4

### Pigeon

Adult pigeons (King variety) which were negative to the tube agglutination test were exposed to infection by four different methods, namely, intraperitoneal inoculation, oral administration, ocular exposure, and contact with infected hens. The infective agent was a saline suspension of *S. pullorum* prepared from a 24-hour agar slant culture with a turbidity equal to tube No. 3 of the McFarland nephelometer scale. The organism used in the suspension was found to be pathogenic for mature chickens through oral administration and intraperitoneal inoculation. The pigeons were tested with the tube agglutination test at frequent intervals. Dilutions of 1:10 and higher, sufficient to determine the titer, unless stated otherwise, were employed. All birds exposed by the first three methods of exposure were placed in individual cages.

The birds were placed on experiment in three different groups. Group I consisted of 6 birds which were exposed to infection by three different methods, as shown in Table 11. Birds 1 and 2 received daily doses, 3 cc., 6 days a week for 8 weeks. At the end of the ninth week, they were placed together. Two squabs, hatched during the fifteenth week, died at 9 days of age. *S. pullorum* was not isolated at necropsy. Agglutinins were first observed 4 weeks after the initial exposure. At no time were agglutination reactions observed to be typical or complete in any dilution.

TABLE 11—DATA CONCERNING EXPOSURES, AGGLUTINATION TITERS, AND NECROPSIES FOR PIGEONS IN GROUP I

How Exposed:		Number of Doses	Bird No.	Sex	Agglutination Reaction				<i>S. pullorum</i> Isolated
Size of Dose					Maximum Titer	Weeks after Exposure	Necropsy Titer	Weeks after Exposure	
Fed	3 cc.	48	1	F	160*	4	0	17	—
			2	M	160*	4	0	17	—
Intraperitoneal	0.5 cc.	6	3	F	640	2	20*	17	—
			4	M	5,120	2	80	17	—
In eye	0.04 cc.	42	5	F	20*	2 & 8	10*	14	—
			6	M	10*	8	0	14	—

\* Agglutination not complete in any dilution.

The adult pigeons were killed and necropsied 17 weeks after the first exposure. At this time both birds were negative to the agglutination test and *S. pullorum* was not isolated. Birds 3 and 4 were inoculated intraperitoneally with 3 daily doses (0.5 cc.) of the suspension. After 1 week, the inoculations were repeated. No agglutinins were detected 4 days after the first exposure, while on the seventh day agglutinins were present. During the second week, clinical manifestations (depression, weakness, ruffled feathers, and inappetance) were observed. At this time the agglutination titer attained its maximum, which was followed by a rapid decline. The birds were placed together in one cage after 9 weeks. At 17 weeks, they were killed and necropsy revealed no gross lesions. *S. pullorum* was not isolated. Birds 5 and 6 were exposed by instilling 1 drop (0.04 cc.) of the suspension into the left eye. Six daily doses per week were administered for 7 weeks. A very slight trace of agglutination was observed in the lower dilutions. The birds were placed together during the sixth week. At 14 weeks, they were killed and necropsied. No gross lesions were observed, and *S. pullorum* was not isolated.

Group II consisted of 12 pigeons, of which 10 were exposed by the same methods employed for Group I, and 2 were held as controls. Two birds were placed in each cage. The same strain as used for the guinea fowl was employed. A suspension of this strain, with a turbidity equal to tube No. 3 of the McFarland nephelometer, was found pathogenic for 3 pullets. At the end of the exposure period, the strain was tested again for its pathogenicity. A loss in pathogenicity was slightly perceptible.

Table 12 shows that 4 pigeons (3, 7, 20, and 26) were exposed to the suspension by the oral route, 4 (8, 12, 16, and 31) by intraperitoneal inoculation, and 2 (10 and 28) by ocular instillation.



TABLE 12—DATA CONCERNING EXPOSURES, AGGLUTINATION TITERS, AND NECROPSIES FOR PIGEONS IN GROUP II

How Exposed:				Agglutination Reaction				
Size of Dose	Number of Doses	Bird No.	Sex	Maximum Titer	Weeks after Exposure	Necropsy Titer	Weeks after Exposure	<i>S. pullorum</i> Isolated
Fed 3 cc.	46	3	M	0	—	0	8**	+***
		7	M	40*	5	0	15	—
		20	M	40*	6	0	15	—
		26	F	40*	6	0	15	—
Intraperitoneal 0.5 cc.	6	8	F	320	2	80	15	—
		12	F	1,280	5	10*	15	+
		16	M	1,280	2	10*	15	—
		31	F	640	2,3,5 & 10	160	15	—
In eye 0.04 cc.	46	10	F	20*	8, 10 & 14	10*	15	—
		28	F	0	—	0	15	—

\* Agglutination not complete in any dilution.

\*\* Died.

\*\*\* Isolated from crop contents.

The daily doses for the oral route group were extended over a period of 8 weeks. Bird 3 died during the eighth week about an hour after feeding. The bird was bled at the time of feeding and no symptoms were observed. The cause of death was not determined. *S. pullorum* was isolated from the ingluvies, but not from the other organs. Birds 7 and 26 hatched 1 squab during the fifth week and 2 during the ninth week. None of the squabs survived beyond 15 days of age and *S. pullorum* was not isolated on necropsy. Complete agglutination, in any dilution, was not observed among the sera tested during the course of the experiment. Birds 7, 20, and 26 were killed and necropsied 15 weeks after the first exposure. No gross lesions were observed and *S. pullorum* was not isolated.

Birds 8, 12, 16, and 31 were given 0.5 cc. intraperitoneally for 3 successive days. These doses were repeated after 7 days. The birds were first tested on the sixth day and no agglutination was observed. On the thirteenth day, complete agglutination was produced by all sera except one, that of bird 12. This bird's maximum titer was attained during the fifth week. After the titers of all the birds had reached the maximum, a marked and rapid decline was observed. The birds were killed and necropsied 15 weeks after the first exposure. Adhesions of the peritoneum and a ruptured yolk were found in bird 12. *S. pullorum* was isolated from the yolk material. Complete agglutination was not produced by serum of this bird at necropsy. *S. pullorum* was not isolated from birds 8, 16, and 31.

The 2 birds exposed by ocular instillation received 46 daily doses (0.04 cc.) extending over a period of 8 weeks. The agglutinin response was slight in bird 10 and negative in bird 28. The birds were killed and necropsied 15 weeks after the first exposure. No gross lesions were observed and *S. pullorum* was not isolated.

The 2 control pigeons remained negative to the agglutination test during the course of the experiment. They were not killed.

Group III, 5 pigeons, was placed in contact with pullorum diseased adult chickens in an 8 x 12 foot house provided with a sun porch (8 x 12 feet). The number of pullorum diseased chickens varied from 10 to 25 during the course of the experiment. Nest boxes, for use of the pigeons, were fastened to the walls. Feed and water were provided in common with the chickens. Mash was placed in hoppers and scratch grain fed in the litter. The pigeons were tested at 4-week

intervals. Dilutions ranging from 1:10 to 1:160 were employed. In order to prevent the hens from injuring the squabs, the latter, at about 3 weeks of age, were removed from the house with their parents and returned when able to fly. The duration of the period away from the flock was approximately 3 weeks. A few birds were temporarily removed for treatment of injuries.

The 5 pigeons and their progeny hatched 30 squabs. Eight squabs (3 to 34 days of age) died during the course of the experiment. Two squabs were unfit for examination and the remaining six were necropsied. *S. pullorum* was not isolated. The duration of the experiment was approximately 15 months. All birds remained negative to the agglutination test. *S. pullorum* was not isolated from those killed and necropsied. Four pigeons (12, 13, 42, and 43) which had been in contact with the infected chickens for 462, 376, 45, and 45 days respectively, were not killed and are not included in the following table, which shows the number of days the birds were in contact with the infected chickens.

<i>Number of Pigeons</i>	<i>Days of Contact</i>	<i>Number of Pigeons</i>	<i>Days of Contact</i>
1	2	3	214
2	16	1	274
2	19	1	301
1	112	1	314
2	113	1	337
1	123	1	378
1	161	2	462
1	191	1	463
1	205		

### Sparrow

For this experiment, 66 sparrows (*Passer domesticus*) were caught in the vicinity of the laboratory. They were confined in metal cages and given scratch grain, grit, and water. All birds were tested by the tube agglutination test prior to the period of exposure. In bleeding the birds, difficulty was encountered in obtaining a sufficient amount of blood to test the sera in the lower dilutions. Whenever possible, dilutions of 1:25, 1:50, and 1:100 were employed. No reactors or naturally infected birds were detected among these 66 sparrows.

Six methods of exposure were employed. Forty-two birds were divided into groups, according to the method of exposure, as follows: Group I, inoculated intraperitoneally; Group II, inoculated subcutaneously; Group III, fed with a pipette; Group IV, instillation into the eye; Group V, contamination of feed; and Group VI, contamination of litter. A saline suspension of *S. pullorum* with a turbidity equal to tube No. 3 of the McFarland nephelometer was prepared from a 24-hour agar slant and used as the infective agent. The birds were tested by the tube agglutination method in dilutions of 1:25, 1:50, and 1:100. In some cases subsequent tests were made at frequent intervals and in a few instances in higher dilutions. All birds in this experiment were necropsied. Birds in the supply cages served as controls.

Clinical manifestations were detected in birds among each group. Depression, ruffled feathers, inappetence and dyspnoea were observed. Since the sparrows were frightened very easily, it was difficult to obtain the complete clinical manifestations. Symptoms were observed for a period of 4 days in some cases. No ovarian lesions were found. It is possible that due to the size of the organ, gross lesions were not perceptible. Unfortunately the determination of agglutinin production was not satisfactory because difficulty was experienced in collecting the blood, and death frequently occurred within a short time after exposure.



Table 13 shows data concerning all groups. The data include the number of sparrows treated, amount of exposure, agglutination reactions, and necropsy observations.

Among the 42 sparrows exposed to infection, 21 were not tested. The sera of 11 of the 21 tested birds contained agglutinins. *S. pullorum* was isolated from 31 of the 42 birds necropsied. No reactors were detected among the controls and *S. pullorum* was not isolated.

### Discussion

According to the experimental observations, *S. pullorum* proved to be pathogenic for the guinea fowl, pheasant, pigeon, and sparrow. It appears that the guinea fowl, pheasant, and especially the sparrow are less refractory to *S. pullorum* infection than the pigeon. Among the 11 guinea fowl exposed to infection, 1 succumbed to the disease and the majority of the others revealed an agglutination titer which would suggest established systemic infection. Even though bacteriological findings were negative for *S. pullorum* at necropsy, this does not necessarily prove that the organism was not present in the body. Unfortunately it was impossible to retain the female guinea fowl longer than 12 weeks, due to a lack of facilities. It is quite possible that, since ovarian development was observed at the time of necropsy, the guinea fowl might have laid eggs at a later time. In view of the fact that *S. pullorum* was recovered from the ovary, the organism might have been eliminated in the egg if the ovary had become active in function.

The pheasant appears to be as susceptible to the disease as the guinea fowl. While some pheasants showed a marked decrease in their agglutination titers, others possessed strong titers that showed very little fluctuation. Among the latter group, *S. pullorum* was recovered from 3 of the birds at necropsy. One laid one infective egg. Hence it appears that pullorum disease manifests itself in adult guinea fowl, pheasants, and chickens quite similarly. While the complete cycle of infection has not been demonstrated in these birds, it does not seem improbable that the disease may gain a stronghold in guinea fowl and pheasant raising establishments, especially under suitable environment, and cause serious losses. Persons engaged in the raising of such fowl should respect this disease as a possible hazard to their success in the rearing of chicks from these species.

The pigeon appears to be quite refractory towards *S. pullorum* infection. Clinical manifestations were observed only in some of the birds inoculated intraperitoneally. The production of agglutinins was slightly stimulated in those birds exposed to infection by the oral and ocular routes. The one case in which *S. pullorum* was isolated from the yolk material suggests that the infection was established in the system even though the agglutination titer showed a marked decline. According to these findings, *S. pullorum* possesses but slight pathogenicity for adult pigeons. Whether similar findings would be observed among squabs cannot be stated at this time and will require further investigation.

It is evident that the sparrow cannot withstand an exposure to a relatively small number of organisms. Death occurred within a week in the majority of cases. *S. pullorum* was recovered from a large number of birds. In a number of cases the organism was recovered some time after the last exposure, indicating that the disease may follow a sub-acute or even a chronic course. Since sparrows do not appear to be capable of tolerating light exposures of *S. pullorum*, it is conceivable that these birds might become infected readily on premises where the disease is found and migrate to a place where the disease is not prevalent, thereby acting as disease disseminators. While naturally infected sparrows have

been found, it is not definitely known that the disease is disseminated by this means under natural conditions. However, the sparrow should not be overlooked as a possible complicating factor in the eradication of this disease. It may be responsible for some of the so-called "breaks" in disease-free flocks when no explanation can be presented for the introduction of the infection.

TABLE 13—AGGLUTINATION REACTIONS AND NECROPSY RESULTS CONCERNING SPARROWS EXPOSED TO *S. pullorum*

Group I, Inoculated by the Intraperitoneal Method.

Lot No.	Bird No.	Dose cc.	No. of Daily Doses	Maximum Agglutination Titer			Necropsy		Serological and Necropsy Remarks
				Days after Exposure	Dilution Reaction		Days after Exposure	<i>S. pullorum</i> Isolated	
				25	50	100			
I	1	.3	3		No test		4	+	Peritonitis Peritonitis
	2	.3	3		No test		4	+	
	3	.3	3		No test		5	+	
II	4	.1	3		No test		6	+	Peritonitis
	5	.1	3		No test		10	+	
III*	6	.1	1		No test		0	—	Died from bleeding on day of inoculation Enlarged spleen Peritonitis
	7	.1	3	7	3	3	8	+	
	8	.1	3	7	3	2	8	+	
	9	.1	3	7	3	1 0	8	+	
IV	10	.1	1		No test		5	+	Necrotic foci in liver, black spleen, peritonitis Peritonitis Peritonitis Died from bleeding
	11	.1	1		No test		5	+	
	12	.1	1		No test		6	+	
	13	.1	1	14	1	0 0	14	—	

Group II, Inoculated by the Subcutaneous Method.

I*	14	.1	3		No test			6	+	Enlarged spleen Enlarged liver, abscess at point of inoculation Inflammation at point of inoculation. Died from bleeding Enlarged spleen
	15	.1	3		No test			6	+	
	16	.1	3	7	1	1	0	7	—	
	17	.1	3	7	0	0	0	11	+	

Group III, Fed with a Pipette.

I	18	.5	5		No test			5	+	Lungs pneumonic, enlarged liver and spleen Lungs pneumonic, hemorrhagic enteritis Lungs pneumonic
	19	.5	5		No test			6	+	
	20	.5	5	6	0	0	0	7	+	
II	21	.1	7	7	3			8	+	Lungs pneumonic, enlarged spleen, hemorrhagic enteritis Necrotic foci in liver, slight pneumonia, orchitis Died from head injuries Agglutination reaction 49 days, 4-4-1-0. Died from lack of water
	22	.1	7	7	0	0		8	+	
	23	.1	7	7	0	0	0	21	+	
	24	.1	7	21,35	4	4	4	56	—	
	25	.1	1		No test			12	+	
III	26	.1	1	13	0	0	0	25	+	

\* Birds given a saline suspension of *S. pullorum*, turbidity equal to tube No. 1 of the McFarland nephelometer, prepared from a 24-hour agar slant.

TABLE 13—AGGLUTINATION REACTIONS AND NECROPSY RESULTS CONCERNING SPARROWS EXPOSED TO *S. pullorum*

## Concluded

## Group IV, inoculated into the eye.

Lot No.	Bird No.	Dose cc.	No. of Daily Doses	Maximum Agglutination Titer			Necropsy		Serological and Necropsy Remarks	
				Days after Exposure	Dilution Reaction			Days after Exposure		S. pullorum Isolated
					25	50	100			
I	27	.04†	8		No test			9	+	Died from injury to right eye
	28	.04	8	10	3	3	3	11	+	
II	29	.04	3		No test			13	+	Died from lack of water
	30	.04	3		No test			13	+	
	31	.04	3		No test			30	+	
	32	.04	3	42	2	1	0	49	—	
III	33	.04	1		No test			2	—	Necrotic foci in liver Agglutination reaction 28 days, 0-0-0
	34	.04	1		No test			9	+	
	35	.04	1		No test			10	+	
	36	.04	1	13	2	1	1	34	—	

## Group V, Exposed to Contaminated Feed.

I	37	2	6	12	3	3	3	15	+	Died from lack of water
	38	2	6	12	0	0	0	16	—	
	39	2	6	12	0	0	0	16	—	
	40	2	6	12,26,28	0	0	0	47	—	

## Group VI, Exposed to Contaminated Litter.

I	41	8	8	14,28,42	0	0	0	51	+	Enlarged spleen Enlarged spleen. Died from bleeding
	42	8	8	14,28,42, 56,70	0	0	0	70	—	

† One drop (.02-.04 cc.) was placed in the left eye.

## Legend

- 4—Complete agglutination.  
 3—Incomplete agglutination.  
 2—Partial agglutination.  
 1—Slight agglutination.  
 0—No agglutination.

## Conclusions

1. *S. pullorum* is pathogenic in varying degrees for the guinea fowl, pheasant, pigeon, and sparrow.
2. Pullorum disease in the adult guinea fowl and adult pheasant resembles the disease in adult chickens.
3. *S. pullorum* was recovered from eggs laid by artificially infected pheasants.
4. The agglutinin production was slightly stimulated in pigeons even after long exposures to the organism.
5. Sparrows succumbed readily to artificial exposure of the organism.
6. It appears that a sound eradication program might find it expedient to recognize these aves as hosts, in addition to chickens, in combating pullorum disease.

## AGGLUTININS IN CHICKS

Rettger and Harvey (71) reported on one agglutination test which was made with sera from chicks that had contracted the disease naturally. A slight reaction was obtained in a 1:50 dilution. They also observed the presence of agglutinins

in the serum of a chick artificially infected. Later Rettger, Kirkpatrick, and Jones (76) state that while the macroscopic agglutination test was of value in detecting ovarian infection of adults, it had not been of value in detecting the disease in chicks. Doyle (27) reports the detection of 11 reactors in 21 chicks, survivors of a natural outbreak, tested at 2 months of age. May and Segelin (64) state that the agglutination test performed on surviving chicks, about 3 weeks after artificial infection, revealed only sporadic reactors. Dearstyne, Kaupp, and Wilfong (23) reported testing and necropsy results on groups of chicks, the progeny of reactors, between the ages of 50 and 90 days. Reactors were found in each group of chicks. Dunlap (28) noted 2 reactors in a group of 25 artificially exposed chicks tested at 4 weeks of age.

### General Procedure for the Investigations

1. Investigations concerning *S. pullorum* agglutinins in chicks were conducted over a period of approximately one and one-half years, and are reported in five parts.

2. Day-old chicks, except as otherwise described, were obtained from two flocks which had been tested for pullorum disease and had been negative for at least two successive years.

3. The method of artificial exposure which Weldin and Weaver (97) found most satisfactory was modified by using one strain of *S. pullorum* instead of two. A 24-hour broth culture of a known pathogenic strain of *S. pullorum* was used and diluted by adding 45 cc. of physiological saline solution to 5 cc. of the culture. At first a pipette and later a Luer syringe were used for oral administration of 0.1 to 0.15 cc. of the diluted culture.

4. Blood samples obtained before the chicks were 4 weeks of age were collected from the cervical blood vessels when the chicks were destroyed. Other blood samples were collected from an incision of the wing vein.

5. Tube agglutination tests were incubated 24 hours at 37° C. and 24 hours at room temperature (22°-25°C.). Readings were recorded as 4-complete; 3-incomplete; 2-partial; 1-slight; and 0-negative agglutination.

6. Necropsies were performed on all chicks which died or which were killed. Resultant *S. pullorum* cultures were subjected to morphological, biochemical, tinctorial, and serological examinations.

### PART I

Consignments of chicks from 6 flocks were received at the laboratory for diagnostic purposes. In these consignments there were 15 living chicks, varying in ages from 5 to 19 days. Immediately prior to necropsy, blood samples were collected. Tube agglutination tests were made in dilutions of 1:25, 1:50, and 1:100. The results of the tests and bacteriological examinations are shown in the following table.

Flock	Age (Days)	Chicks	Agglutination	<i>S. pullorum</i> isolated
1	19	2	0	2
2	7	3	0	0
3	7	3	0	3
4	17	2	0	2
5	8	3	2-1-0*	1**
6	5	2	0	2

\* Two chicks negative, one chick partial 1:25, slight 1:50, negative 1:100.

\*\* The serum of this chick was negative.

Among 15 chicks 5 to 19 days of age, from 6 flocks, the sera of 14 chicks were negative to the tube agglutination test and *S. pullorum* was isolated from 10 chicks. The serum of 1 chick contained agglutinins, but not in sufficient quantity to produce complete agglutination, and *S. pullorum* was not isolated.

## PART II

In three groups, at different times, 119 day-old chicks were exposed to artificial infection and 22 day-old chicks were used for control purposes. Among the exposed chicks, 26 died and *S. pullorum* was isolated from each of these chicks. The remainder, with the exception of 4 controls, were killed at various ages. Blood samples were obtained immediately prior to necropsy. The results of tube agglutination tests in dilutions of 1:25, 1:50, and 1:100 and bacteriological examinations of 111 chicks are shown in the following table.

Age (Days)	Chicks	Killed	Agglutination	<i>S. pullorum</i> isolated
5	Exposed	3	0	3
	Controls	0	—	—
7	Exposed	52	0	40
	Controls	10	0	0
14	Exposed	26	0	13
	Controls	5	0	0
19	Exposed	12	3-3-3*	4
	Controls	3	0	0

\*Incomplete agglutination in one chick.

Among 93 artificially exposed chicks, varying in age from 5 to 19 days, no sera showed complete agglutination, and *S. pullorum* was isolated from 60. The serum of 1 chick showed an incomplete agglutination in all dilutions, and *S. pullorum* was not isolated. The 18 control chicks were negative to the tube agglutination test and to bacteriological examination.

Whole blood agglutination tests were made on 43 exposed and 4 control chicks, and all reactions were negative.<sup>1</sup>

## PART III

Chicks were hatched, in two groups, from a flock of 19 reacting hens and 1 reacting male. A few eggs for the second hatch were obtained after a non-reacting male had been added to the flock.

For the first hatch, 123 eggs were placed in a Prairie State incubator (144 egg capacity). Three eggs were broken during the incubation period. Of the remaining 120 eggs, 73 (60.83 per cent) were fertile, which yielded 22 (18.33 per cent) chicks. However, only 19 chicks were suitable to be placed under the brooder. In the second hatch, 135 eggs were placed in the incubator with the following results: three eggs were broken during incubation; 98 (74.24 per cent) were fertile and 21 (15.91 per cent) chicks were hatched. The chicks in both groups were tested with the tube agglutination test in dilutions of 1:25, 1:50, and 1:100, and higher if the titer exceeded these dilutions. Both groups were also tested with the whole blood agglutination test.<sup>1</sup>

Group I consisted of 19 chicks. At respective ages of 3, 5, and 7 days, 3 chicks died and *S. pullorum* was isolated from 2; the remaining 16 and 2 controls of the same age were killed on the seventh day.

<sup>1</sup> The antigen for the whole blood agglutination test was furnished by Dr. M. Dorset, Bureau of Animal Industry, United States Department of Agriculture.

Data concerning the 9 chicks which reacted either to one or to both agglutination tests and bacteriological examinations are shown in the following table:

Chick	Whole Blood Agglutination	Tube Agglutination	<i>S. pullorum</i> isolated
4	Suspicious	4-4-0	—
8	Positive	4-4-1-0	+
10	Positive	4-2-0	+
11	Negative	2-1-0	—
12	Negative	3-2-0	+
13	Negative	3-1-0	+
15	Negative	4-2-0	—
16	Suspicious	4-2-0	+
7	Negative	1-0-0	+

*S. pullorum* was isolated from 6 of the 9 chicks whose sera showed agglutinins. *S. pullorum* was isolated from 7 chicks which did not react to either one of the tests. The 2 controls were negative to both of the tests and to bacteriological examination.

Group II consisted of 21 chicks. At the ages of 7 and 10 days 2 chicks died and *S. pullorum* was isolated from both. The remaining 19 and 5 controls of the same age were killed on the fourteenth day. A slight reaction to both tests was shown by 1 chick, and *S. pullorum* was not isolated. In a second chick agglutinins were indicated to be present by the tube test, but not by the whole blood test, and *S. pullorum* was isolated. To both agglutination tests, 17 chicks were negative, and *S. pullorum* was isolated from 7. The 5 controls were negative to both of the agglutination tests and to bacteriological examination.

#### PART IV

A group of 52 day-old chicks was exposed to artificial infection. Up to 4 weeks of age, 20 died and *S. pullorum* was isolated from each chick. Beginning at 4 weeks of age, the chicks were tested by the tube agglutination test at weekly intervals. Dilutions of 1:10 and higher, sufficient to determine the titer, were employed. A chick whose serum produced partial, incomplete, or complete agglutination in a dilution of 1:20 or higher was considered to be a reactor. Immediately upon detection, reactors were isolated in individual cages, and the pen was cleaned thoroughly. On the first test 6 reactors were detected. Reactors appeared at each test up to and including the test made at 11 weeks of age. No additional reactors appeared at later tests. A total of 24 reactors was detected among the 32 chicks.

Observations concerning 23 chicks made during the period between the fourth and fifteenth weeks are shown in Table 14.

*S. pullorum* was isolated from 6 non-reactors and 1 of 3 reactors which died. At the age of 11 weeks it was necessary to kill 2 chicks, and at the age of 15 weeks 12 males were killed. Of these 14 chicks, 10 were considered to be reactors and 4 non-reactors at the time of necropsy. Among these 4 non-reactors, 3 (Nos. 26, 33, and 41) had been considered to be reactors at earlier tests. *S. pullorum* was isolated from 3 reactors among these 14 chicks.

Observations were continued on the 8 reactors (pullets) and 1 non-reactor (a cockerel) beyond the fifteenth week. The cockerel was negative to the tube agglutination test up to 6½ months, at which age it was killed, and *S. pullorum* was not isolated. The 8 pullets were to be retained in individual cages until 2 months after sexual maturity was attained. (A pullet was considered sexually mature when it laid its first egg.) Table 15 contains observations and data concerning the 8 pullets.



TABLE 14—SEROLOGICAL AND NECROPSY DATA CONCERNING TWENTY-THREE ARTIFICIALLY EXPOSED CHICKS (PART IV)

Chick No.	Sex	Age when Detected as Reactor	Agglutination Reaction					S. pullorum Isolated
			Maximum Titer	Age	At Necropsy			
					Remarks	Titer	Age	
		Weeks		Weeks			Weeks	
29*	M	....	.....	.....	Died	0	5	+
13*	M	....	.....	.....	Died	0	6	+
27*	F	....	.....	.....	Died	0	6	+
51*	F	....	.....	.....	Died	20	6	+
36	M	4	160	4	Died	40	7	—
20*	F	....	.....	.....	Died	0	8	+
47*	M	....	.....	.....	Died	0	8	+
45	F	9	40	9	Killed	20	11	—
50	M	6	160	6 & 7	Killed	40	11	—
40	M	4	80	7-12 inc.	Died	80	13	+
12	F	10	320	13	Died	160	15	—
14	M	7	640	14	Killed	640	15	—
25*	M	....	.....	.....	Killed	10	15	—
26	M	5	320	6	Killed	20**	15	—
28	M	4	2,560	6 & 14	Killed	2,560	15	+
30	M	6	320	13 & 14	Killed	320	15	+
32	M	6	320	11-14 inc.	Killed	320	15	—
33	M	8	40	8, 9 & 12	Killed	20**	15	—
37	M	8	1,280	9	Killed	320	15	—
41	M	4	640	4	Killed	20**	15	—
43	M	11	320	13	Killed	160	15	—
44	M	6	640	12 & 14	Killed	640	15	—
46	M	5	2,560	14	Killed	2,560	15	+

\* Not considered a reactor at any time.

\*\* Titer not sufficient to be considered a reactor.

Sexual maturity was attained by 5 birds which were killed 2 months afterward, and *S. pullorum* was isolated from 2. The agglutination titers of the 3 birds from which *S. pullorum* was not isolated gradually became lower, and the birds were not regarded as reactors at the time of necropsy. Birds 21, 35, and 49 did not attain sexual maturity, and *S. pullorum* was isolated from each.

TABLE 15—SEROLOGICAL AND NECROPSY DATA CONCERNING EIGHT PULLETS EXPOSED TO ARTIFICIAL INFECTION AS CHICKS (PART IV)

Pullet No.	Age when Detected as Reactor	Agglutination Reaction						S. pullorum Isolated
		Maximum Titer	Age	At Maturity		At Necropsy		
				Titer	Age	Titer	Age	
	Weeks		Weeks		Weeks		Weeks	
11	7	1,280	9	320	28	640	37	+
21	4	20,480	14 & 17	.....	....	2,560	45	+
34	8	1,280	12	40	26	40	37	—
35	4	2,560	11	.....	...	160	40*	+
39	10	1,280	29, 30 & 36	160	27	1,280	37	+
42	7	320	9-11 inc.	20	22	20	36	—
48	8	160	12, 16 & 17	40	22	20	36	—
49	8	5,120	42	.....	....	2,560	45	+

\* Died.

## PART V

A lot of 129 day-old chicks was divided into two groups. Group A, consisting of 75 chicks, was exposed to artificial infection. Group B, consisting of 54 chicks, served as controls.

The chicks in Group A did not show clinical symptoms of pullorum disease. On the day following exposure, 1 chick died and *S. pullorum* was not isolated. This was the only mortality up to 2 weeks of age. A possible explanation of the failure of this group of chicks to react to the exposure in the same manner that chicks in Part IV reacted is that the size of dose was less, the chicks may have been slightly older and more resistant, and the pathogenicity of the strain may have changed. Then 24 chicks from Group A were placed in a separate pen and designated as Group A-1. Each chick in Group A-1 was subjected to a second exposure consisting of 0.2 cc. of a 48-hour broth culture. Beginning at 4 weeks of age, all chicks in Groups A and A-1 were tested by the tube agglutination test, at weekly intervals, except as otherwise noted. A sufficient quantity of *S. pullorum* antigen was prepared for the duration of the experiment. Dilutions of 1:10 and higher, sufficient to determine the titer, were employed. A chick

TABLE 16—SEROLOGICAL AND NECROPSY DATA CONCERNING THIRTY-TWO ARTIFICIALLY EXPOSED CHICKS (PART V)

Chick No.	Sex	Age when Detected as Reactor	Agglutination Reaction					<i>S. pullorum</i> Isolated
			Maximum Titer	Age	At Necropsy			
					Remarks	Titer	Age	
		<i>Weeks</i>		<i>Weeks</i>			<i>Weeks</i>	
286*	F	....	.....	.....	Died	10**	5	+
250*	M	....	.....	.....	Died	20**	7	+
277*	F	....	.....	.....	Died	0	7	—
293*	M	....	.....	.....	Died	0	7	—
284*	F	....	.....	.....	Died	0	8	—
314	F	6	160	6 & 7	Died	80	9	+
310	F	5	1,280	9	Died	1,280	10	+
241*	M	....	.....	.....	Killed	0	14	—
245*	M	....	.....	.....	Killed	0	14	—
246*	F	....	.....	.....	Killed	0	14	—
248*	M	....	.....	.....	Killed	0	14	—
280*	M	....	.....	.....	Killed	0	14	—
283*	M	....	.....	.....	Killed	0	14	—
285*	M	....	.....	.....	Killed	0	14	—
289*	M	....	.....	.....	Killed	0	14	—
290*	M	....	.....	.....	Killed	0	14	—
292*	M	....	.....	.....	Killed	0	14	—
294*	M	....	.....	.....	Killed	0	14	—
296*	M	....	.....	.....	Killed	0	14	—
297*	M	....	.....	.....	Killed	0	14	—
304*	M	....	.....	.....	Killed	0	14	—
305*	M	....	.....	.....	Killed	0	14	—
307*	M	....	.....	.....	Killed	0	14	—
311*	M	....	.....	.....	Killed	0	14	—
313*	M	....	.....	.....	Killed	0	14	—
244	M	7	640	14	Killed	640	15	+
278	M	8	1,280	8	Killed	80	15	+
301	M	9	640	10, 11 & 14	Killed	640	15	—
302	M	8	80	8	Killed	40**	15	+
306	M	8	640	14	Killed	640	15	+
312	M	5	160	5-10 inc. & 14	Killed	160	15	—
281	M	7	1,280	7	Killed	640	18	—

\* Not considered a reactor at any time.

\*\* Agglutination not complete in 1:20 and higher dilutions.



whose serum completely agglutinated the antigen in a dilution of 1:20 or higher was considered to be a reactor. Immediately upon detection, reactors were isolated in individual cages and the pens were cleaned thoroughly. After all of the reactors were detected, the non-reactors were tested at biweekly intervals.

Group A consisted of 50 chicks which were subjected to one exposure. At the age of 23 days, 1 chick died and *S. pullorum* was isolated. All the reactors, 16 in number, were detected by the end of the ninth week. Observations concerning 32 chicks made during the period between the fourth and eighteenth weeks are shown in Table 16.

*S. pullorum* was isolated from 2 of the 5 non-reactors and from both of the reactors which died. Of the 19 non-reactors which were killed, *S. pullorum* was isolated from 1 (No. 302). This chick had been considered a reactor in earlier tests. *S. pullorum* was isolated from 3 of the 6 reactors which were killed.

At the end of the eighteenth week, 10 non-reacting and 7 reacting pullets remained in Group A. The non-reacting pullets were placed in individual cages at the age of 5 months and, with one exception, were retained until at least 1 month after having attained sexual maturity. This 1 bird was killed because of infectious laryngotracheitis at approximately 9 months of age. The agglutination reactions indicated these 10 birds to be non-reactors at all tests, and *S. pullorum* was not isolated.

Data concerning the 7 reacting pullets are shown in Table 17.

TABLE 17—SEROLOGICAL AND NECROPSY DATA CONCERNING SEVEN PULLETS EXPOSED TO ARTIFICIAL INFECTION AS CHICKS (PART V)

Pullet No.	Age when Detected as Reactor	Agglutination Reaction						<i>S. pullorum</i> Isolated
		Maximum Titer	Age	At Maturity		At Necropsy		
				Titer	Age	Titer	Age	
	<i>Weeks</i>		<i>Weeks</i>		<i>Weeks</i>		<i>Weeks</i>	
249	6	10,240	40	.....	....	10,240	41	+
276	5	2,560	6 & 20	1,280	30	1,280	35	—
279	8	320	20	.....	....	80	41	+
287	8	2,560	32, 33 & 34	320	30	640	40	+
299	5	1,280	6	40	26	20	36	—
300	4	80	4-6 inc.	10	27	40	37	—
308	9	1,280	10	80	29	80	36	+

Sexual maturity was attained by 5 birds, which were killed 2 months later, and *S. pullorum* was isolated from 2. The agglutination titers of 2 of the other 3 birds gradually became lower. At the age of 41 weeks, the 2 pullets which had not attained sexual maturity were killed, and *S. pullorum* was isolated from both.

Group A-1 consisted of 24 chicks which were subjected to two exposures. By the end of the ninth week, 11 reactors were detected. Observations concerning 14 chicks, made during the period between the fourth and eighteenth weeks, are shown in Table 18.

*S. pullorum* was isolated from 1 (No. 253) of 7 non-reactors and from 2 of 7 reactors. The sera of 3 (Nos. 257, 270, and 273) of the 7 reactors did not produce complete agglutination in some of the tests prior to necropsy.

At the end of the eighteenth week, 6 non-reacting and 4 reacting pullets remained in Group A-1. The non-reacting pullets were placed in individual cages at the age of 5 months and, with two exceptions, were retained for at least 1 month after having attained sexual maturity. The first of these 2 was killed because of "paralysis" at approximately 5 months, and *S. pullorum* was not

TABLE 18—SEROLOGICAL AND NECROPSY DATA CONCERNING FOURTEEN ARTIFICIALLY EXPOSED CHICKS (PART V)

Chick No.	Sex	Age when Detected as Reactor	Agglutination Reaction					<i>S. pullorum</i> Isolated
			Maximum Titer	Age	At Necropsy			
					Remarks	Titer	Age	
		<i>Weeks</i>		<i>Weeks</i>			<i>Weeks</i>	
253*	M	....	.....	.....	Died	80**	8	+
254	F	6	1,280	6	Died	320	8	—
259*	F	....	.....	.....	Died	0	8	—
260*	M	....	.....	.....	Died	0	8	—
261*	F	....	.....	.....	Died	0	8	—
270	F	5	160	5	Died	20**	8	—
271*	M	....	.....	.....	Died	40**	8	—
268	F	4	1,280	7	Died	160	11	+
251*	M	....	.....	.....	Killed	0	14	—
269*	M	....	.....	.....	Killed	0	14	—
257	M	9	80	9 & 10	Killed	40**	15	—
265	M	7	320	8, 13 & 14	Killed	320	15	—
266	M	8	320	11 & 12	Killed	160	15	+
273	M	7	640	7	Killed	40**	18	—

\* Not considered a reactor at any time.

\*\* Agglutination not complete in 1:20 and higher dilutions.

isolated. The second was killed because of infectious laryngotracheitis at approximately 9 months. Extensive lesions suggestive of pullorum disease were observed, and *S. pullorum* was isolated. The agglutination titer of this bird had been considered as suspicious on several tests. At necropsy, its serum completely agglutinated *S. pullorum* antigen in the 1:20 dilution. *S. pullorum* was not isolated from the other 4 non-reacting pullets.

The 4 reacting pullets in Group A-1 were killed 2 months after having attained sexual maturity, and data are presented in Table 19. *S. pullorum* was isolated from 2 birds. The agglutination titers of the other 2 gradually became lower, and they were not regarded as reactors at the time of necropsy.

TABLE 19—SEROLOGICAL AND NECROPSY DATA CONCERNING FOUR PULLETS EXPOSED TO ARTIFICIAL INFECTION AS CHICKS (PART V)

Pullet No.	Age when Detected as Reactor	Agglutination Reaction						<i>S. pullorum</i> Isolated
		Maximum Titer	Age	At Maturity		At Necropsy		
				Titer	Age	Titer	Age	
	<i>Weeks</i>		<i>Weeks</i>		<i>Weeks</i>		<i>Weeks</i>	
255	5	640	6	0	27	10	36	—
256	5	5,120	6	160	27	320	37	+
258	4	1,280	5 & 6	160	29	320	40	+
275	9	80	9, 33, 34 & 36	10	32	10	41	—

The 54 control chicks were tested at biweekly intervals after the age of 5 weeks. At the age of 3 months, all but 10 pullets were used for other purposes. These 10 birds were retained until approximately 8 months of age, when all but 2 had attained sexual maturity. No reactors were detected among these controls at any time.

### Discussion

*S. pullorum* infection was suspected to be present in the 15 chicks, 5 to 19 days of age, of the miscellaneous consignments on account of the histories and

the suggestive lesions at necropsy. The tube agglutination test did not show agglutinins to be present in the 10 chicks from which *S. pullorum* was isolated. The 1 chick whose serum contained agglutinins, but not in sufficient amount to bring about complete agglutination, was negative to bacteriological examination.

Among a larger number, 93, of artificially exposed chicks destroyed at the same ages as those of the miscellaneous groups, the serum of only 1 chick contained agglutinins. Again the agglutinins were not present in sufficient amount to cause complete agglutination of the antigen, and the chick was negative to bacteriological examination. Whole blood agglutination tests, made on 43 chicks, were negative. Upon bacteriological examination *S. pullorum* was isolated from 60 of these 93 chicks.

In two hatches from a flock of reacting hens, the tube agglutination test showed agglutinins to be present in varying titers in the sera of 9 of the 16 chicks killed at 7 days of age, and in 2 of the 19 chicks killed at 14 days of age. Among the chicks which reacted, *S. pullorum* was isolated from 6 of the 9 and from 1 of the 2. *S. pullorum* was also isolated from 5 of the 7 and from 7 of the 17 chicks which did not react. Agglutinins were detected by the whole blood agglutination test in 4 of the 9 and in 1 of the 2 chicks which reacted to the tube agglutination test. No reactions were noted by the whole blood method in chicks that were negative to the tube test.

Observations based upon these relatively small numbers of chicks in the three groups appear to indicate that specific agglutinins are present in only a small number of chicks which harbor *S. pullorum* before the age of 2 or 3 weeks. Specific agglutinins sufficient to bring about complete agglutination appeared as early as the seventh and fourteenth days in a few chicks from reacting hens. However, the number of chicks which were found to be bacteriologically positive was larger than the number which reacted to the agglutination test. There appeared to be no relation between the presence of agglutinins in the sera and the demonstrable presence of *S. pullorum* organisms in chicks less than 3 weeks of age.

In the 52 chicks of Part IV, which had been exposed to artificial infection the suggestive clinical symptoms and lesions were confirmed by bacteriological examination in a majority of cases. Agglutinins were present in a few chicks at the time of the first test, i.e., at 4 weeks of age. Agglutinins continued to appear in other chicks up to the end of the eleventh week, but not thereafter. Between the fourth and the eleventh weeks of age, 24 reactors were detected among the 32 chicks tested. It appeared that agglutinins required variable periods of time for development. Marked lowering of the agglutination titers occurred in some instances and suggests an ability on the part of some infected chicks to overcome *S. pullorum* infection. Agglutinins did not disappear entirely from the sera of the 8 reacting pullets. *S. pullorum* was not isolated from the 3 pullets which had the lowest agglutination titers at the time they were destroyed. These 3 came into production earlier than those pullets from which the organism was isolated. It is also noted that *S. pullorum* was isolated from 3 pullets which failed to come into production.

During a period of 2 weeks following artificial exposure, no suggestive symptoms appeared among a group of 75 chicks. Bacteriological examinations showed *S. pullorum* to be present in 13 of the 50 chicks (Group A) subjected to one exposure and in 6 of the 24 chicks (Group A-1) subjected to two exposures. In both groups there were a few chicks whose sera contained *S. pullorum* agglutinins as early as the fourth week of age. In Group A all of the reactors, 16 in number, were detected by the end of the ninth week of age. In Group A-1 there were 12 reactors and 11 of these were detected by the end of the ninth week. The additional reactor in the latter group was detected at the test at the time of necropsy, at 9 months of age, although on some of the earlier tests this pullet had been

regarded as suspicious. It appears that the tube agglutination test is capable of detecting the infected chicks, with few exceptions, when the test is applied to artificially exposed chicks between the ages of 4 and 11 weeks. Lowering of agglutination titers even to the point of disappearance occurred in a small number of chicks, and upon failure to isolate *S. pullorum* was regarded as indicative of recovery from the disease. Again *S. pullorum* was isolated from the 2 pullets which failed to come into production.

### Conclusions

1. Although *S. pullorum* agglutinins sufficient in amount to establish a diagnosis were not present in the sera of 15 chicks from 5 to 19 days of age, *S. pullorum* was isolated from 10 of the chicks.

2. *S. pullorum* agglutinins sufficient in amount to establish a diagnosis were not present in the sera of 93 artificially exposed chicks from 5 to 19 days of age. *S. pullorum* was isolated from 60 of the chicks.

3. In the sera of some chicks, 7 and 14 days of age, hatched from eggs from reacting hens, *S. pullorum* agglutinins were present in sufficient quantity to establish a diagnosis, and *S. pullorum* was isolated from some chicks which did not show agglutinins.

4. In three groups of chicks, all reactors were detected, with one exception, by the end of the eleventh, ninth, and ninth weeks, respectively.

5. Some reactors detected between the fourth and ninth weeks of age later became non-reactors, and *S. pullorum* was not isolated upon necropsy.

6. *S. pullorum* was isolated from non-reacting chicks up to 8 weeks of age.

### AVENUES OF INFECTION

Investigations have definitely established the fact that pullorum disease is disseminated among live poultry, including both immature and adult stock. The disease has also been reproduced through artificial means of exposure. Rettger (70) in his first report concerning pullorum disease observed that the malady could be reproduced in young chicks (2 to 4 weeks of age) by subcutaneous inoculation with pure culture of the causative organism. Later Rettger, Kirkpatrick, and Card (79) were successful in producing infection by inoculating the organism into the oviduct. They reported that the male plays an important role in the transmission of the disease from diseased to normal hens according to circumstantial evidence, and that the probability of oviduct infection being brought about in any other way, as for example through infected litter, appears quite remote. Dalling and Allen (20) also demonstrated that the disease could be reproduced in young chicks by subcutaneous inoculation. They found that chicks fed 0.5 cc. of a saline suspension of live culture (one billion organisms per cubic centimeter) would succumb to the disease. Feeding of broth cultures also produced death. They reported that an amount as small as 0.0001 cc. of a suspension containing one billion organisms per cubic centimeter produced death in one of the two chicks fed. It was concluded that a correlation existed between the age of the chick and the tolerance for the dose of infective agent.

Doyle (27) showed that adult fowls could be infected by subcutaneous and intravenous inoculations with broth cultures of the organism. The disease was also reproduced through oral administration and oviduct inoculation of the organism. The organism was pathogenic for chicks when fed or inoculated subcutaneously in doses as small as 0.001 cc. Chicks were also infected by instilling into the eye a couple of drops of broth culture. Gwatkin (39) in feeding adults

with an aqueous suspension of *S. pullorum* found that agglutinins appeared in the blood stream within 3 to 12 days. Hinshaw, Upp, and Moore (46) were able to infect half-day-old chicks by either swabbing or inoculating the organism into the nostrils. Tittler (89) advanced the hypothesis that pullorum disease may be disseminated by moisture exhaled from an infected lung of a chick and inhaled by a normal chick. Beck and Eber (4) were successful in reproducing the disease in adult hens by subcutaneous inoculation, but not by intravenous or oral administration. Five chicks, two days of age, succumbed to the disease when 2 drops of a suspension of the organism were instilled into the nostrils. Doyle and Matthews (26) reported that exposure of chicks to alfalfa dust containing *S. pullorum* caused typical pulmonary lesions of pullorum disease. Of the 21 chicks which had been exposed to dust containing *S. pullorum*, 76 per cent developed typical gross lung lesions of pullorum disease. In the control group, no lesions suggestive of the disease were observed. Gwatkin and Glover (41) isolated *S. pullorum* from the nasal passages of two among 61 adult birds examined.

Edwards and Hull (30) fed 16 pullets and 16 cockerels (9 months old) with a saline suspension of *S. pullorum* having a density equal to 0.25 on the McFarland nephelometer scale. Each pen was given 500 cc. of the suspension. An acute infection was produced. Agglutinins were detected on the first test 7 days after feeding, and on the fourteenth day 16 birds reacted. Seven birds became permanent reactors and from them *S. pullorum* was isolated. Miessner (65) reported that Ansorg, Nussfog, and Hof found *S. pullorum* in the cloacae of live hens. Weldin and Weaver (97) found that infection may result from the entrance of the organism into the respiratory tract as well as into the alimentary tract, but they believe that the seat of post-hatching infection is more often in the digestive tract than in the respiratory tract. They also reported that chicks inoculated intratracheally revealed no pulmonary lesions, but 2 chicks fed capsules containing the organism showed a pulmonary infection. They stated that "quite evidently infection can take place in the chick regardless of portal of entry."

While it is apparent that *S. pullorum* may gain entrance into the body through various channels, more information concerning these channels and other possible avenues of infection would contribute to the knowledge on dissemination, control, and eradication of the disease.

### Procedure of the Experiment

Four different avenues for introducing infective material were selected, namely, instillation into the eye; oral administration; inoculation into the cloaca; and instillation into a skin incision on the plantar surface of the foot. Thirty-five Rhode Island Red birds were divided into three groups and each group was exposed to the infective agent on a different date. Recovered *S. pullorum* strains in these experiments were identified by morphological, biochemical, tinctorial, and serological characteristics.

Group I, consisting of 4 pullorum disease-free pullets (approximately 10 months of age) was exposed to infection by the ocular route. The birds were placed in individual cages and divided into two lots with 2 birds in each lot. The infective agent was a saline suspension of a 24-hour agar growth adjusted to a turbidity of tube No. 3 of the McFarland nephelometer. One strain of *S. pullorum* recently isolated from the ovary of a hen was employed. The suspension was administered by placing 2 drops (approximately 0.08 cc.) on the conjunctiva of the left eye. Agglutination tests were made at frequent intervals to determine the immunological response to the infection. Dilutions of 1:10 and higher were employed to ascertain the titer. Birds in both lots were first exposed to infection on January 26.



The birds in Lot A were given 2 series of 6 consecutive daily doses. These 2 series of doses were separated by 1 day. Table 20 shows that no agglutinins were observed 4 days after the first exposure. On the seventh day, agglutinins were present in both birds and persisted until the time the birds were necropsied. One bird manifested a marked inflammatory reaction of the structures within the periorbita of the infected eye. Bird No. 1 was killed and necropsied at the end of 8 weeks. Peritonitis and ovarian lesions were observed. *S. pullorum* was isolated. Bird No. 2 appeared listless and anemic 10 weeks after the first inoculation. At this time an inspissated egg was expelled. Death occurred on April 17. Necropsy revealed an enlarged, friable, and mottled liver with a rupture of the right lobe. Pericarditis and peritonitis were also observed and *S. pullorum* was isolated.

Birds in Lot B were given two series of 3 consecutive daily doses a week apart. Table 20 shows that agglutinins were observed at the same time as in Lot A, but in a lesser amount. Bird No. 3 manifested an inflammatory reaction in the periorbital structures with an extensive involvement of the inferior palpebra. Bird No. 3 was killed and necropsied on March 25. Necropsy findings revealed an enlarged, hemorrhagic liver, and two ovules, one being hemorrhagic and the other misshapen. Bird No. 4 was killed and necropsied May 14. Extensive peritonitis and misshapen, inspissated ova were observed. *S. pullorum* was isolated from both birds.

Group II consisted of 16 pullorum disease-free Rhode Island Red cockerels (approximately 2½ months of age), divided into four lots. Factors such as size and general condition of the birds were considered in selecting the birds for the different lots. All birds were placed in individual cages. The infective agent employed consisted of a saline suspension prepared from a 24-hour agar growth and adjusted to a turbidity ranging between 1.5 and 1.75 on the McFarland nephelometer scale. The organism used was a strain recently isolated from a chick (2½ months of age). Birds in Lots A, C, and D were exposed to infection through the ocular route. Birds in Lot B received the infective material per orem. The first dose for all lots was given on August 10. The size of the daily dose was practically the same for all birds (0.03 cc.). All birds were tested by the tube agglutination method at approximately weekly intervals in dilutions of 1:10 and higher, sufficient to determine the titer. The birds were killed and necropsied approximately 10 weeks after the first exposure. The following tissues were placed on culture medium: pericardial fluid, liver, and spleen from all birds and testicles, heart, and kidney from some birds. The *S. pullorum* strains isolated were tested for colonial, tinctorial, biochemical, and agglutinable characteristics.

Lot A consisted of 5 birds which received 6 consecutive daily doses. Clinical manifestations, such as increased lacrimation and infiltration of the structures in the periorbita, were observed approximately 2 weeks after the first exposure. These gross pathological changes disappeared after 4 weeks. Table 21 shows that agglutinins were present 7 days after the first exposure. All birds developed a serum titer of 1:640 or higher during the period of observation. Two birds (Nos. 194 and 225) revealed lesions. In bird 194 a pericarditis, abscesses in the heart muscle, enlarged spleen, and peritonitis were observed. In bird 225 the changes were confined to the heart and pericardial sac. *S. pullorum* was isolated from birds 194 and 224.

Lot B consisted of 5 birds which received 6 consecutive daily doses. Each of the individual doses was diluted with 1 cc. of sterile saline in order to facilitate the administration per orem. The suspension was administered by inserting a 1 cc. pipette into the esophagus. No clinical manifestations were observed in these birds. Table 21 shows that agglutinins were detected in bird 188, 10 days after the first exposure. Bird 216 possessed agglutinins 17 days after the first

TABLE 20—AGGLUTINATION TITERS AND NECROPSIES FOR BIRDS IN GROUP I

Lot	Bird No.	Dates of Tests and Agglutination Titers																	Date of Necropsy	S. pullorum Isolated	
		1/30	2/2	2/5	2/9	2/12	2/16	2/24	3/2	3/9	3/16	3/23	3/25	3/30	4/6	4/13	4/21	4/27			5/11
A.....	1	0	80?	320	5,120	5,120	5,120	10,240	1,280	1,280	2,560	1,280	10,240	1,280	10,240	5,120P				3/25/31 4/17/31	+
	2	0	1,280P	640	1,280	2,560	1,280	640	640	1,280	5,120P	1,280	10,240	1,280	10,240	5,120P					+
B.....	3	0	10	320	2,560	5,120	5,120	2,560	5,120	640	1,280	640	10,240	2,560	10,240	5,120	5,120	1,280		3/25/31 5/14/31	+
	4	0	10	320	5,120	20,480	10,240	10,240	40,960	5,120	10,240	10,240	10,240	2,560	10,240	5,120	5,120	1,280			+

?—Doubtful agglutination

P—Titer not determined.

TABLE 21—AGGLUTINATION TITERS AND NECROPSIES FOR BIRDS IN GROUP II

Lot	Bird No.	Dates of Tests and Agglutination Titers															Date of Necropsy	S. pullorum Isolated
		8/10	8/17	8/20	8/22	8/24	8/27	8/31	9/8	9/14	9/21	9/28	10/5	10/13	10/19	10/19	10/20	10/23
A.....	186	0	20	80	640	640	640	160	160	40	80	80	80	160	80		10/20	—
	194	0	320	2,560	2,560	5,120	5,120	5,120	1,280	320	640	640	640	1,280	640		10/19	—
	218	0	10	20	320	2,560	2,560	2,560	5,120	640	1,280	640	640	1,280	640		10/19	—
	224	0	40	160	1,280	2,560	2,560	1,280	640	640	640	640	640	1,280	1,280		10/20	—
B.....	225	0	160	640	1,280	1,280	320	640	160	80	80	40	40	80	40		10/20	—
	188	0	0	640	2,560	2,560	1,280	1,280	160	80	80	40	40	80	80		10/20	—
	195	0	0	0	0	0	0	0	0	0	0	0	0	0	0		10/23	—
	209	0	0	0	0	0	0	0	0	0	10	10	20	80	40		10/20	—
C.....	216	0	0	0	0	0	80	640	320	160	160	80	40	80	40		10/19	—
	227	0	0	0	0	0	0	0	0	0	0	10	0	0	0		10/19	—
	200	0	320	320	640	640	640	320	160	160	320	160	320	640	640		10/19	—
	205	0	20	640	2,560	2,560	5,120	1,280	640	160	160	80	80	160	80		10/19	—
D.....	226	0	10	40	160	320	640	1,280	160	80	80	80	80	160	80		10/19	—
	189	0	20	320	1,280	2,560	5,120	5,120	5,120	5,120	5,120	10,240	10,240	20,480	10,240		10/23	—
	211	0	80	160	640	1,280	1,280	2,560	640	320	640	320	640	640	640		10/20	—
	234	0	40	160	320	320	160	160	160	80	80	40	40	40	40		10/23	—

exposure. No agglutinins were detected in birds 195 and 227. Bird 209 revealed a weak titer. No significant lesions were observed on necropsy. *S. pullorum* was isolated from one bird, No. 188.

Lot C consisted of 3 birds which received 3 consecutive daily doses. Bird 205 manifested a local inflammatory reaction around the eye exposed to the inoculum. Recovery was complete 4 weeks after the first exposure. All birds in this lot possessed agglutinins 7 days after the first exposure. Table 21 shows their weekly sera titers. Cardiac lesions commonly found in pullorum disease were present in birds 200 and 205. *S. pullorum* was isolated from bird 200.

Lot D consisted of 3 birds which received 1 dose of the suspension. Clinical manifestations which consisted of a general systemic reaction and inflammatory changes in both eyes were observed in bird 189. It was not definitely proved that the reaction in both eyes was caused by pullorum infection. Bird 211 showed a local reaction in the eye used for inoculation. Table 21 shows that agglutinins were present 7 days after the first exposure and persisted during the course of the experiment. Cardiac lesions were present in all birds. In bird 189, the parenchyma of the liver was friable with ecchymotic hemorrhages present on the surface. A nephritis and enteritis were also observed. *S. pullorum* was isolated from birds 189 and 234.

In birds 194, 200, 224, and 234, *S. pullorum* was isolated from the pericardial fluid only. In bird 189, the organism was isolated from the heart and spleen and in bird 188 from the spleen only.

Group III consisted of 15 pullorum disease-free Rhode Island Red birds, approximately 3 months old which were divided into two lots. All birds were retained in individual cages. Two avenues of exposure were employed, namely, instillation of the infective agent into an incision in the skin of the plantar surface of the foot and inoculation into the cloaca. The former avenue was selected because occasionally birds show an enlargement of the foot, with a scab attached to the plantar surface. *S. pullorum* has been isolated from a case of this type. Whether *S. pullorum* infection is the primary or secondary cause in such cases cannot be stated. However, it appears plausible for the organism to enter the body if the continuity of the skin is broken resulting in either localized or generalized foci of infection.

The infective agent was a saline suspension prepared from a 24-hour agar slant culture with a turbidity with a range between 1.5 and 1.75 on the McFarland nephelometer scale. Quantitative determinations revealed that the different suspensions varied from 550 to 710 million organisms per cubic centimeter. The strain used was the same as employed for Group II. The size of the dose was approximately 0.03 cc. The birds were tested with the macroscopic agglutination test at weekly intervals. Dilutions of 1:10 and higher, sufficient to determine their titers, were used. All birds were killed and necropsied approximately 10 weeks after the first exposure with one exception. This bird died 3 weeks after the first exposure. Culture material was taken from the pericardial fluid, liver, and spleen in all cases. Other tissues which appeared infected were also cultured. Strains resembling *S. pullorum* were examined in the same manner as those isolated in Group II.

Lot A consisted of 5 cockerels which were exposed to infection by placing the inoculum in an incision in the skin of the plantar surface of the foot. Two incisions, extending through the cutis, were made with a sharp pointed knife. The incisions were approximately 0.5 cm. in length and bisected each other at right angles. The date of the first exposure was August 31. The inoculum was not completely absorbed in some cases because the dose (0.03 cc.) appeared to be too large. Furthermore, the incision was disturbed at the time the second, third, and fourth doses were administered which caused a slight hemorrhage,



making it difficult to determine the amount of inoculum entering the incision. Each bird received four doses. An acute inflammation was observed in the region of the metatarsal joint in all individuals. The inflammatory changes consisted of enlargement, tenderness, and discoloration of the structures. In one bird the tarsal joint was enlarged. The birds were prone to sit down and if in a standing position very little if any body weight was placed on the inoculated foot. One bird, No. 228, died on September 19. Necropsy findings revealed that death was due to a septicemic form of the disease. *S. pullorum* was obtained from the pericardial fluid, liver, spleen, peritoneum, bone marrow, tarsal joint, and digital cushion. Approximately 4 weeks after the first exposure, the clinical manifestations had subsided.

Table 22 shows that agglutinins were first observed 10 days after the first exposure. The maximum titers in all cases occurred approximately 2 weeks after the first exposure. Necropsy findings revealed in all birds a proliferation of the tissues in the region of the metatarsal joint and in one bird (206) an acute pericarditis. *S. pullorum* was isolated from the latter bird only.

Lot B consisted of 10 birds (4 females and 6 males) which received the inoculum in the cloaca. The walls of the cloaca were separated by traction on the borders of the anus. The inoculum was retained as far as could be determined. In a few birds a slight congestion of the cloacal mucosa was observed. Table 22 shows that a trace of agglutinins was observed on the sixth day after the first exposure and on the eighth and tenth days agglutinins were well established in all the birds. Although agglutinins appeared earlier than in Lot A, the titers were neither as strong nor as persistent. Necropsy findings revealed no significant lesions except in one bird. This bird, No. 221 (male) showed an acute pericarditis. *S. pullorum* was isolated from this bird only.

### Summary and Discussion

In Group I ocular inoculation caused an acute local reaction in the tissues within the periorbita as well as a stimulation for the production of agglutinins. Agglutinins were present approximately 7 days after the first exposure. Infection was definitely established with characteristic lesions of the disease. *S. pullorum* was recovered from all birds.

In Group II the birds inoculated by the eye route manifested clinical symptoms similar to birds in Group I, but less pronounced. This also was true in the lesions observed and in the recovery of *S. pullorum*. Agglutinins were present in all birds at approximately 7 days. In the birds which were fed the organism, agglutinins appeared at approximately the tenth day in 1 bird. Agglutinins were detected in 3 of the 5 birds during the experiment. No significant lesions were observed at necropsy and *S. pullorum* was isolated from one.

In Group III, the birds, inoculated into the skin incision, all revealed agglutinins at approximately the tenth day after the first exposure. Severe inflammatory reactions were observed in the region at the point of exposure. Gross lesions were not common and *S. pullorum* was isolated from 1 bird. The birds inoculated into the cloaca possessed agglutinins at approximately the sixth day after the first exposure. At necropsy gross lesions were observed and *S. pullorum* was isolated from 1 bird only.

From these observations, it is apparent that birds may become infected when the organism comes in contact with the conjunctiva. In what manner the organisms enter the body cannot be stated at this time, but it does not appear that all or any part of the inoculum passed through the lacrimal duct into either the respiratory or digestive passages and entered the body along those channels. The structures within the periorbita reacted to the infective agent, as manifested

TABLE 22—AGGLUTINATION TITERS AND NECROPSIES FOR BIRDS IN GROUP III

Lot	Bird No.	Dates of Tests and Agglutination Titers											Date of Necropsy	<i>S. pullorum</i> Isolated
		9/5	9/8	9/10	9/12	9/14	9/16	9/21	9/28	10/5	10/13	10/19	10/26	11/2
B.....	191	0	10	320	640	320	320	160	80	80	160	40	20	10
	197	0	0	320	640	640	320	160	80	20	10	20	10	10
	199	0	0	10	320	1,280	2,560	2,560	320	160	160	80	80	80
	201	0	0	320	640	320	320	160	40	40	20	10	10	0
	208	0	0	320	1,280	640	640	640	80	80	40	40	80	160
	221	0	0	320	2,560	640	5,120	5,120	1,280	1,280	2,560	640	640	320
	229	0	0	640	2,560	1,280	2,560	1,280	320	160	160	80	40	80
	231	0	0	160	1,280	2,560	1,280	640	160	160	160	80	40	20
	238	0	80	320	320	160	80	40	20	0	0	10	0	0
	239	0	0	80	640	640	320	320	80	40	80	40	40	40
A.....	206	0	0	20	1,280	2,560	2,560	5,120	1,280	640	1,280	640	640	640
	220	0	0	80	2,560	2,560	10,240	10,240	2,560	640	1,280	320	320	160
	228	0	0	80	1,280	2,560	2,560	2,560						
	236	0	0	20	640	2,560	1,280	2,560	1,280	640	640	320	160	160
	237	0	0	10	160	640	1,280	640	320	320	320	80	40	20

by inflammatory changes, and this suggests that the organisms may have entered the conjunctiva or associated structures. In birds exposed to the organism by the ocular route, agglutinins appeared in the blood stream around the seventh day, whereas in those birds exposed by oral administration, agglutinins appeared around the tenth day. In all birds exposed by the ocular route agglutinins were produced, while in the orally exposed group some birds did not produce agglutinins. Gross lesions were more common and the percentage of isolation of *S. pullorum* was higher in the ocular exposed group. The occurrence of infection through the ocular route appears to be possible under natural conditions. Contaminated litter, feed, and droppings coming in contact with the eye might lead to the establishment of infection in the body. It is possible that this avenue of infection might play a role in the dissemination of the disease among chicks in the incubator, especially in the forced draft type where hatching debris is more or less in constant circulation and in that way comes in contact with the eye of the chick.

While agglutinins appeared earlier in the birds exposed through the cloaca than in the birds exposed through the skin incision, yet the persistency and the strength of their titers were not as great. The infection did not appear to be as well established in the group exposed through the cloaca. Exposure to infection through these channels demonstrates that even though the organism did not become permanently established in the body, agglutinins existed to indicate that transient infection had been present. Also it may be possible that even through the use of the most careful and thorough necropsy technique, the recovery of the organism from some reacting birds may meet with failure. Under natural conditions with suitable environment, it appears possible that birds might contract the disease through these channels.

In comparing the four different avenues as to the ease with which the organism may enter the body, no direct comparisons can be made since the different avenues were not all tested at the same time and under identical conditions. However, the results suggest that birds might be more subject to contracting the disease, if exposed through the eye route than through the other avenues studied. Infection appears to occur less readily when the organism is administered through the oral route than through the other avenues.

### Conclusions

1. Pullorum disease can be reproduced in chickens by dropping a suspension of the organisms on the conjunctiva, into an incision in the skin of the plantar surface of the foot, into the cloaca, and by oral administration.

2. The introduction of organisms through the oral route did not appear as successful in reproducing the disease as the other avenues of exposure which were studied.

3. It appears possible that pullorum disease dissemination may occur through all these avenues under natural conditions where a suitable environment exists.

### OBSERVATIONS CONCERNING DIAGNOSTIC TESTS FOR PULLORUM DISEASE

Since pullorum disease is inherent in character and may exist in apparently normal birds, the fact has become recognized, as supported by an abundance of data, that the disease can be eradicated by detecting the infected adult birds. Various methods of detecting such birds have been investigated. According to

investigations and results in eradication, the macroscopic agglutination method is the most efficient and the most extensively employed. Jones (52) was the first to employ the macroscopic tube agglutination test for the detection of infection in adult birds. Runnells and others (81) recommended the rapid serum agglutination test for pullorum disease eradication. Investigations concerning their relative merits have shown that properly trained persons can use the two methods in the diagnosis of the disease with nearly the same degree of efficiency.

Bunyea, Hall, and Dorset (15) first described the rapid whole blood agglutination test. They employed a concentrated unpreserved live antigen and whole blood. Blood smears were made upon a glass surface to which the test fluid was added and mixed. A clumping of the bacteria within a certain time limit was regarded as a positive reaction. The testing of whole dry blood was also described. The authors found the results of this method to check quite closely with the results of the tube method. Sawyer and Hamilton (84) reported that an antigen prepared by a biological house for the whole blood test and placed in the hands of a poultryman gave the following results: among 26 birds tested, 6 were diagnosed as reactors. Necropsy revealed that 13 birds contained *S. pullorum*. Green and Robinson (38) reported the whole blood test very satisfactory, although in some cases they found that birds with low titers might escape detection. They stated that much more work is necessary before one can determine the real value of this type of test. Bleeker (8) tested 2,159 blood samples with the whole blood and tube methods. The whole blood method was regarded as but slightly less efficient. Schaffer and others (85) described changes in the technique for the preparation of the antigen and the method of conducting the test. They recommended a stained, preserved antigen and the employment of a loop for measuring and conveying the fresh blood to the testing plate. Various degrees of reactions which occur in the tube method were reported. Reactions which occur within one minute after mixing the antigen and blood were regarded as positive, whereas those reactions appearing more slowly were considered as suspicious. The loop method was recommended to insure a constant dilution of antigen and blood. Coburn and Stafseth (18) described the preparation of stained antigen and technique for a whole blood test. Thirty pullets were tested four times at two-week intervals with the whole blood and tube methods. Twelve positive reactors were detected by the whole blood method. *S. pullorum* was isolated from 11 of the reactors, of which 9 were positive to the tube method. Six birds which gave cloudy reactions were considered doubtful. The authors did not state whether the two birds that did not react positively to the tube method and from which *S. pullorum* was isolated, were either doubtful or negative to the tube method. Hall and Bunyea (42) tested 206 hens with the whole blood and tube methods. An agreement of 91 per cent was observed. Three dilutions (1:25, 1:50, and 1:100) were employed in the tube method. Agglutination in the 1:25 dilution was regarded as suspicious while a reaction in the 1:50 or 1:100 was regarded as positive. The tube method detected 143 reactors of which 114 fowls (80 per cent) at necropsy yielded *S. pullorum* from the ovaries. The whole blood test detected 135 reactors of which 112 (83 per cent) at necropsy yielded *S. pullorum* from their ovaries. The two reactors detected by the tube method and from which *S. pullorum* was isolated, reacted partially to the tube test and slightly to the whole blood test. In the culturing of organs, only the ovary is mentioned. Cultures were incubated 24 hours. Welch (96) tested 5 flocks, ranging in size from 66 to 318 birds, with whole blood and tube methods. Both the wet and dry whole blood methods were used. The dry whole blood test appeared to be 90 per cent as efficient as the tube method. By a comparative study of wet and dry whole blood methods in 6 flocks, he found the latter to be 94 per cent as efficient. The author states,

"Conceding that there is a possible 10 per cent error in using the dry blood, yet this method is sufficiently accurate for certain conditions. It can be used by poultrymen who do not especially desire a B.W.D.-free flock, but who would like to minimize their losses from B.W.D. The decreased cost of the test appeals to the flock owner." Durant (29) tested 259 birds with whole blood, rapid serum, and tube methods. Antigen for the whole blood test was furnished by Dr. M. Dorset, United States Bureau of Animal Industry. The author concluded that the tube test was more efficient than the whole blood and rapid serum methods according to the testing results and necropsy findings in 111 reacting birds. In Finland, Stenius (87) tested 5 poultry flocks, ranging in size from 170 to 349 birds, with whole blood and rapid serum tests. He concluded that the rapid serum method was considerably more reliable than the whole blood method.

Since certain factors such as quality of the antigen, diagnostic dilution or dilutions, and the length of incubation period appear to influence the efficiency of agglutination tests, it must be recognized that as long as such factors vary in the different investigations, varied results may be anticipated. Unfortunately, in some of the investigations referred to, information concerning these factors was lacking. While the results thus far reported show that the whole blood method is not as efficient as the tube method, yet they offer encouragement for further investigation of the newer method.

In the endeavor to obtain further knowledge concerning the whole blood test, the following investigation was made. This investigation consisted of two parts: the first concerned birds at the laboratory, and the second concerned three commercial poultry flocks.

### Procedure of the Experiment

Two groups maintained at the laboratory and consisting of 25 and 27 positive reacting birds, respectively, were tested with the whole blood and tube tests. In the majority of instances the birds were tested by both methods on the same day. The test fluid employed for the whole blood test was a stained, preserved antigen, furnished by Dr. M. Dorset, Bureau of Animal Industry, United States Department of Agriculture. The technique employed was as follows: a small amount of blood was taken from a wing vein incision and placed on a glass plate with a microscopic glass slide. A smear somewhat thicker than that used in microscopical study was made on the glass plate. One drop of test fluid was added to the blood film with a medicine dropper. The plate was tilted slightly upward and downward, which appeared to have a beneficial influence on the agglutination phenomenon. The reaction was recorded approximately two minutes after the antigen was added to the blood smear.

In the tube test, the sera were tested in dilutions of 1:10, 1:20, and higher, sufficient to determine the titer, 1 cc. of antigen being used for each dilution. The turbidity of the antigen was equal to tube No. 1 of the McFarland nephelometer. The period of incubation was 24 hours at 37° C. and an additional 18 to 24 hours at room temperature. The agglutination reactions were recorded as follows:

- 4—complete agglutination
- 3—incomplete agglutination
- 2—partial agglutination
- 1—slight agglutination
- 0—no agglutination

All birds whose sera gave a reaction of 4-3-2, 4-4-1, or higher in the dilutions of 1:10, 1:20, and 1:40 were considered positive. Sera which agglutinated *S.*

TABLE 23—AGGLUTINATION RESULTS OF THE WHOLE BLOOD AND TUBE TESTS FOR BIRDS IN GROUP I

Dates and Results of Tests																			
12/29	12/28	1/2	1/6	1/8	1/13	1/20	1/19	1/30	1/27	2/6	2/3	2/11/31	2/17/31	2/24/31	3/5/31	3/11/31	3/17/31		
Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	
N	P	N	P	N	P	N	P	N	P	D	P	N	P	P	N	P	P	N	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				

## Whole Blood Test

P—Positive (rapid agglutination forming large clumps of bacteria).  
 P?—Not strongly positive (slow agglutination forming medium to large clumps).  
 D—Doubtful (agglutination forming small to medium clumps).  
 N?—Slightly suspicious (slight and delayed agglutination).  
 N—Negative (no agglutination).

## Tube Test

P—Positive.  
 D—Doubtful.  
 N—Negative.

NT—No test.

U—Unsatisfactory.

\* Bled on January 9.



*pullorum* antigen in a lesser degree were called doubtful, and no agglutination was regarded as negative.

The results of the tests for both methods for Group I are given in Table 23. As is shown in the table, all the birds with a few exceptions were tested 12 times with both methods over a period of approximately 2½ months. In five instances no tests were recorded for the whole blood test and in one instance, one serum was unsatisfactory for the tube test. Both methods showed complete agreement in all tests for 12 birds. Reactions such as either slightly suspicious or negative for the whole blood test and either doubtful or positive for the tube test or conversely so, were considered disagreements. The total number of tests made with both methods was 260, and 17.31 per cent did not agree. A total of 45 disagreements was recorded among the tests of 13 birds. Five birds were necropsied during the period the birds were tested. Culture material, in the majority of cases, was selected from pericardial fluid, liver, bile, spleen, peritoneum, ovary, oviduct, testicle, and suspicious lesions in birds necropsied throughout this investigation. The necropsy results for the 5 birds are presented in the following table:

<i>Bird</i> <i>No.</i>	<i>Date</i>	<i>Whole Blood</i> <i>Test</i>	<i>Tube</i> <i>Test</i>	<i>S. pullorum</i> <i>Isolated</i>
10185	1/14/31	N	D	—
10285	3/6/31	N T	N T	+
10342	2/13/31	P	P	+
10397	1/28/31	P ?	P	+
10418	1/9/31	N	P	+

The results of both tests for Group II are given in Table 24. All but 3 birds were tested 8 times. Both methods showed complete agreement in all tests for 24 birds. Among a total of 209 tests with both methods, there were 5 disagreements (2.39 per cent). Two birds were necropsied during this period of testing. The results of the necropsies are presented in the following table:

<i>Bird</i> <i>No.</i>	<i>Date</i>	<i>Whole Blood</i> <i>Test</i>	<i>Tube</i> <i>Test</i>	<i>S. pullorum</i> <i>Isolated</i>
27833	3/5/31	N	P	—
28139	3/1/31	N T	N T	—

Three commercial flocks which were diagnosed as infected in the routine testing for pullorum disease were selected for this investigation. Flock I revealed 11.89 per cent reactors, according to the tube agglutination test. The reactors were distributed throughout the entire flock. This flock had passed a negative test the previous season but through mismanagement, infection was introduced.

This flock, including all birds on the premises, was tested 3 times at approximately 4-week intervals with the whole blood and the tube tests. The whole blood test was conducted in the following manner: The equipment consisted of stained, preserved antigen, received from the same source as that used in the first part of this investigation; glass plate (15 x 11 inches); microscopic slides; dish for used slides; bleeding knife; tumbler containing cotton and 5 per cent phenol for bleeding knife; leg bands; leg band pliers; records; and improvised crates for holding tested birds. The personnel consisted of the tester and two assistants. The duties of each were as follows: One assistant caught the birds which were confined in one corner of the pen with wire netting; the other assistant reported the leg band number, held the bird for the tester, and placed it in a retaining crate. The tested birds were removed from the retaining crate by personnel

who collected blood samples for the tube test. These operations interfered in no way with those of the whole blood test. All positive or doubtful birds were placed in a bird crate and the negative birds were liberated into the pen. The tester made the incision in the wing vein, transferred the blood with a microscopic slide to the glass plate, making a smear slightly thicker than a smear for microscopical study, added the test fluid to the blood film, and recorded the leg band number and the interpretation of the agglutination reaction. The plate was tilted slightly upward and downward which appeared to have a beneficial influence on the agglutination phenomenon. The interpretation of the reaction was recorded approximately 2 minutes after the blood and test fluid were mixed. The 1:25 dilution and 1 cc. of antigen were employed in the tube method. The results were recorded after incubating the tests at 37° C. for 24 hours.

On December 1, the first test, 220 and 219 birds were tested with the whole blood and the tube tests, respectively. (One blood sample was broken and therefore could not be tested.) The whole blood test was conducted under quite unsuitable conditions. Dust and feathers frequently interfered with the blood-antigen mixture on the glass plate. Also weather conditions were not the most

TABLE 24—AGGLUTINATION RESULTS OF THE WHOLE BLOOD AND TUBE TESTS FOR BIRDS IN GROUP II

Bird No.	Dates and Results of Tests											
	1/30/31		2/6		2/3		2/11/31		2/17/31		2/24/31	
	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test	Whole Blood Test	Tube Test
27696	P	P	P	P	P	P	P	P	P	P	P	P
27736	P	P	P	P	P	P	P	P	P	P	P	P
27762	P	P	P	P	P	P	P	P	P	P	P	P
27800	P	P	P	P	P	P	P	P	P	P	P	P
27804	P	P	P	P	P	P	P	P	P	P	P	P
27833	D	P	D	P	P	P	P	P	P	P	P	P
27843	P	P	P	P	P	P	P	P	P	P	P	P
27860	P	P	P	P	P	P	P	P	P	P	P	P
27869	P	P	P	P	P	P	P	P	P	P	P	P
27872	D	P	P?	P	P	P	P	P	P	P	P	P
27888	P	P	P	P	P	P	P	P	P	P	P	P
27906	P	P	P	P	P	P	P	P	P	P	P	P
28003	P	P	P	P	P	P	P	P	P	P	P	P
28006	D	P	D	P	P	P	D	D	P	D	D	P
28007	P	P	P	P	P	P	P	P	P	P	P	P
28009	P	P	P	P	P	P	P	P	P	P	P	P
28012	P	P	P	P	P	P	P	P	P	P	P	P
28024	D	P	D	P	P	P	P	P	P	P	P	P
28029	P	P	P	P	P	P	P	P	P	P	P	P
28037	P	P	P	P	P	P	P	P	P	P	P	P
28053	P	P	P	P	P	P	P	P	P	P	P	P
28110	P	P	P	P	P	P	P	P	P	P	P	P
28139	P	P	P	P	P	P	P	P	P	P	P	P
28179	P	P	P?	P	P	P	P?	P	P	P	P	P
28184	P	D	D	P	P	P	P	P	P	D	N?	P
28200	P	P	P	P	P	P	P	P	P	P	P	P
28210	P?	P	P	P	P	P	P	P	P	P	P	P

NOTE—For legend refer to Table 23.



favorable. On December 12, the flock owner learned that 22 birds had escaped the test on December 1. These birds were immediately tested by both methods. All the birds on the premises were confined in three different houses, which necessitated moving the equipment three times. The time required to test all the birds was approximately 5½ hours.

The results of the first test were as follows:

	Whole Blood	Tube
	Test	Test
Number of birds positive.....	23	27
Number of birds doubtful.....	25	0
Number of birds negative.....	194	214

Group	Classification	Number of Birds	Retest with W.B.T. only, on Dec. 4		
			N	D	P
I	Positive to both tests.....	17			
II	Negative to both tests.....	191*			
III	Positive to W.B.T. and negative to tube test.....	6	4	1	1
IV	Doubtful to the W.B.T. and negative to tube test..	17	17	0	0
V	Doubtful to the W.B.T. and positive to tube test....	8**	1	2	3
VI	Negative to the W.B.T. and positive to tube test....	2	1	0	1

\* Does not include the bird that reacted negatively to W.B.T. and whose blood sample was broken.

\*\* Two birds were not retested with the whole blood test.

Based on the whole blood retest, the two birds which were negative to the tube test and doubtful and positive respectively to the whole blood test, and the two birds which were negative to the whole blood test and positive to the tube test, were submitted to the laboratory for necropsy. The necropsy results of these four birds and of two birds included in the test of December 12 are as follows:

Group	Bird No.	Date of Necropsy	W.B.T.	Testing Results at Necropsy						Necropsy Remarks	
				Tube Test						<i>S. pullorum</i> Isolated	Source
				10	20	40	80	160	320	640	
III	11856	1/21	P?	2	1	0	0	0			—
	39314	1/18	N	0	0	0	0	0			—
V	11780	1/21	P?	4	4	3	3	1	0		—
	11756*	1/22	P	4	4	4	2	2	0		+
	11731*	1/22	P	4	4	4	2	2	1	0	—
VI	11853	1/14	N	4	4	4	4	2	0		+

\* These two birds which reacted doubtfully to the W.B.T. and positively to the tube test on December 12, were not retested with the W.B.T.

On December 30, the second test, 224 birds were tested by both methods. The technique of the whole blood method, as employed on December 1, was modified. The test fluid was placed on the glass plate with a medicine dropper held in a vertical position. One drop was equal to 0.05 cc. The blood was added to the drop of test fluid with a wire loop (5 mm. in diameter). A loopful of blood

with a biconvex film amounted to 0.02 cc. The blood and antigen were thoroughly mixed with the loop, and spread over an area approximately one-half inch in diameter. The wire loop was rinsed in water and dried with gauze. The time for reading was the same as for the slide-smear method. The temperature of the glass plate was maintained at 22-35° C. This was accomplished through the use of an improvised hot water heater. Keeping the testing plate at a temperature above 22° C. appeared to produce more rapid and distinct reactions, especially with bloods of low titered birds. The weather conditions were quite favorable at the time of this test, even though the atmospheric temperature was 15° F. Considerable dust which was present in the air settled on the tests and the glass plate. The time consumed for the testing operations amounted to approximately 4½ hours. The results of the second test were as follows:

	Whole Blood Test	Tube Test
Number of birds positive.....	0	0
Number of birds doubtful.....	3	0
Number of birds negative.....	221	224*

\* Includes one bird that escaped on the December 30 test, but tested negative on January 4.

Group	Classification	Number of Birds	Retest with W.B.T. only, on Jan. 4		
			N	D	P
I	Positive to both tests.....	0			
II	Negative to both tests.....	221			
III	Doubtful to the W.B.T. and negative to tube test..	3	0	3	0

Group	Bird No.	Date of Necropsy	W.B.T.	Testing Results at Necropsy					Necropsy Remarks	
				Tube Test					<i>S. pullorum</i> Isolated	
				10	20	40	80	160		
III	{	11746	2/11	N?	1	0	0	0	0	—
		11757	2/11	N	0	0	0	0	0	—
		11848	2/11	N?	1	0	0	0	0	—

On January 25, the third test, 214 birds were tested by both methods. The technique of the whole blood test was the same as that employed on December 30. The temperature in the poultry house was approximately 45° F. The time consumed for the testing operations amounted to 4 hours. The results of the tests were as follows:

	Whole Blood Test	Tube Test
Number of birds positive.....	0	0
Number of birds doubtful.....	5	1
Number of birds negative.....	209	213

Group	Classification	Number of Birds	Retest with W.B.T. only, Feb. 1		
			N	D	P
I	Positive to both tests.....	0			
II	Negative to both tests.....	208			
III	Doubtful to W.B.T. and negative to tube test.....	5	4	1	0
IV	Negative to W.B.T. and doubtful to tube test.....	1	1	0	0

Group	Bird No.	Date of Necropsy	W.B.T.	Testing Results at Necropsy					Necropsy Remarks
				Tube Test					<i>S. pullorum</i> Isolated
				10	20	40	80	160	
III	60856	2/10	N?	0	0	0	0	0	—
IV	11678	2/10	N	0	0	0	0	0	—

Flock II revealed 8.26 per cent reactors as determined by the agglutination test. This flock had not been tested previously. The reactors were distributed throughout the entire flock.

All the birds on the premises were tested 3 times at 4- to 6-week intervals. On January 7, 8, and 9, a total of 691 birds was tested by both methods. The testing operations and technique on the first two days were the same as employed in the second test of Flock I. On January 9, only one assistant was furnished which necessitated modifying the procedure in order to conserve time. The person conducting the whole blood test did not bleed birds, but instead obtained blood from the incision made by the person collecting samples for the tube test. The mean temperatures for the three days were 40.5°, 30.5°, and 32.5° F., respectively. The time required to test the entire flock with the whole blood test was 15 hours and 45 minutes. The results of the tests were as follows:

	Whole Blood Test	Tube Test
Number of birds positive.....	39	48
Number of birds doubtful.....	5	13
Number of birds negative.....	647	630

Group	Classification	Number of Birds
I	Positive to both methods.....	37
II	Negative to both methods.....	630
III	Doubtful to W.B.T. and positive to tube test	4
IV	Doubtful to W.B.T. and doubtful to tube test	1
V	Negative to W.B.T. and positive to tube test	7
VI	Positive to W.B.T. and doubtful to tube test	2
VII	Negative to W.B.T. and doubtful to tube test	10

The two tests did not agree on 24 birds. These birds, included in Groups III to VII, inclusive, were retested on January 14. The results are given in Table 25.

The birds were classified into three groups, according to the results of the retest. Four birds reacted positively with both methods. These birds were disposed of with the remainder of the positive reactors. Among the remainder of

TABLE 25—AGGLUTINATION AND NECROPSY RESULTS CONCERNING BIRDS IN FLOCK II

Bird No.	FIRST TEST Jan. 7-9		SECOND TEST, Jan. 14								Disposal		THIRD TEST, Jan. 22*								FOURTH TEST, Jan. 27								NECROPSY REMARKS				
	W. B. T.	Tube Test 1-25	Tube Test								W. B. T.	Disposal	Tube Test								W. B. T.	Tube Test											
			10	20	40	80	160	320	640	1280			10	20	40	80	160	320	640	1280			10	20	40	80	160	320			640	1280	
80183	D	4	4	4	3	1	0				Necropsy	P	4	4	4	4	1	0				P	4	4	3	2	0					80	Pericardial fluid, spleen, ovary
80297	N	J									Necropsy	N	4	3	0							N									20	Negative	
80474	D	4	4	4	3	1	0				Necropsy	D	4	4	1	0						D	3	3	2	1	0				160	Spleen, ovary	
80494	P	2	4	4	1	0					Necropsy	D	4	3	2	0						N	2	2	1	0					20	Spleen, cysts, ovary	
80500	P	3	4	4	1	1	0				Necropsy	P	4	4	3	1	0					D	4	4	2	1	0				80	Liver, spleen, ovary, abdominal fluid	
80513	N	4									Necropsy	D	4	4	3	2	0				P	4	3	2	1	0				160	Cyst and ovary		
80548	N	4	4	4	4	3	1	0			Necropsy	P	4	4	4	4	3	2	0			P	4	4	4	3	2	0			320	Liver, spleen, heart abscesses	
80569	D	2	4	4	4	4	2	0			Necropsy	N	4	3	2	1	0				N	2	2	2	0					40	Negative		
24852	N	4	4	4	4	1	1	0			Necropsy	D	4	4	3	1	0				N									160	Pericardial fluid, liver, cyst, ovum, cyst in oviduct		
49235	N	4	4	4	4	2	0				Necropsy Retained	N									N										320	Negative	
75262	N	2	3	2	1	0					Retained	N	N	N	N	N	N	N	N	N	P	4	4	4	3	3				0	0	Spleen, cysts, ova	
70279	N	1	3	2	0						Retained	N	N	N	N	N	N	N	N	N	N	1	0							0	0	Liver, spleen, ovary	
85278	N	4	4	2	1	0					Retained	N	N	N	N	N	N	N	N	N	N	1	0							10	Negative		
80328	N	3	4	3	2	0					Retained	N	N	N	N	N	N	N	N	N	N	3	2	0						40	Pericardial fluid, liver, spleen, ovary		
80406	N	2	2	1	0						Retained	N	N	N	N	N	N	N	N	N	N										10	Negative	
80439	N	2	3	2	0						Retained	N	N	N	N	N	N	N	N	N	N										40	Pericardial fluid, liver, spleen, ovary	
24844	N	1	2	1	1	0					Retained	N	N	N	N	N	N	N	N	N	N	1	0							10	Negative		
24846	N	3	4	2	2	1	0				Retained	N	N	N	N	N	N	N	N	N	N	2	1	0						20	Negative		
24854	N	2	4	2	1	0					Retained	N	N	N	N	N	N	N	N	N	N	4	3	1	0						40	Pericardial fluid, liver	
24858	N	4	3	2	1	0					Retained	N	N	N	N	N	N	N	N	N	N										20	Negative	
75281	D	4	4	4	4	3	2	1	0		Culled	P	4	4	4	3	2	1	0														
80227	N	1	4	4	4	4	4	4	4	4	Culled	P	4	4	4	4	4	4	4	4													
80337	D	4	4	4	4	3	1	0			Culled	P	4	4	4	3	1	0															
80399	N	4	4	4	4	4	2	0			Culled	P	4	4	4	4	2	0															

\* Birds in the retained group were tested on February 4 and 24 instead of January 22 and 27.

Note:—For legend refer to Table 23.

the 24 birds, 10 were retained in isolation on the premises and 9 were submitted to the laboratory for necropsy. Two birds were not necropsied: one was destroyed by the flock owner and the other later reacted strongly positive to both methods. The latter group was retested three times, including the test at the time of necropsy. The results are given in Table 25.

The birds in the retained group were retested on February 4 and 24. Following the test of February 24, this group was submitted to the laboratory for necropsy. The testing results and the findings at necropsy are shown in Table 25.

On February 4 and 5, Flock II was retested by both tests. The technique of the whole blood test for February 4 was the same as that employed on January 7. On February 5, the technique of the whole blood test was slightly modified. The blood collector who collected the samples for the tube test held the bird for the tester of the whole blood test. After the tester had procured a loopful of blood, the blood collector obtained a sample from the same incision. The latter also placed the bird in the retaining crates. Two helpers, one catching the birds and the other removing the tested birds from the retaining crates, assisted in the testing. This change was made because the blood collector was more familiar with the proper manner of holding the birds for bleeding. The atmospheric temperature was approximately a few degrees above freezing. The total number of birds tested with both methods was 610. The total time consumed for the testing operations amounted to 12 hours and 10 minutes. The results of the second test were as follows:

	<i>Whole Blood</i> <i>Test</i>	<i>Tube</i> <i>Test</i>
Number of birds positive*.....	1	1
Number of birds negative.....	599	599

\* This table does not include the 10 reacting birds which were retained on the premises after the first test. The testing results of these birds are reported in Table 25. The bird which was positive to the whole blood test was also positive to the tube test.

On March 23, Flock II was tested for the third time. The technique for the whole blood test was similar to that of February 5, except that one assistant recorded the leg band numbers and results or the tester conducting the whole blood test. The atmospheric temperature was slightly below freezing. A total of 422 birds was tested in 6½ hours. The results of the tests were as follows:

	<i>Whole Blood</i> <i>Test</i>	<i>Tube</i> <i>Test</i>
Number of birds positive.....	0	0
Number of birds doubtful.....	3	2
Number of birds negative.....	419	420

These five doubtful reacting birds were submitted to the laboratory for necropsy and the results were as follows:

Group	Bird No.	Results of Necropsy			
		Date	W.B.T.	Tube Test	<i>S. pullorum</i> Isolated
Doubtful to W.B.T.	75182	3/30	N?	N	—
	80271	3/30	N?	N	—
	80543	3/30	N?	N	—
Doubtful to tube test	80124	3/30	D	D	—
	80549	3/30	N	N	—

Flock III had not been tested previously and revealed 6.15 per cent reactors as determined by the agglutination test. The reactors were distributed throughout the entire flock.

On February 8 the entire flock was tested by both methods. A total of 276 birds was tested in approximately 6 hours. The birds were confined in a number of small pens which necessitated frequent moving of the testing equipment. The atmospheric temperature was a few degrees below freezing. The technique of the whole blood test was identical to that employed on February 5 in Flock II. The results of the tests were as follows:

	Whole Blood	Tube
	Test	Test
Number of birds positive.....	14	14
Number of birds doubtful.....	4	4
Number of birds negative.....	258	258

Group	Classification	Number of Birds	Retested with W.B.T. only, Feb. 15		
			N	D	P
I	Positive to both tests.....	14			
II	Negative to both tests.....	256			
III	Negative to W.B.T. and doubtful to tube test.....	2	1*	0	0
IV	Doubtful to W.B.T. and negative to tube test.....	2	2	0	0
V	Doubtful to both tests.....	2	1**	0	0

\* One bird was killed by owner.

\*\* One bird died.

The surviving reactors in Groups III and V were submitted to the laboratory for necropsy. Birds in Group IV were retained in the flock. The results of the necropsies were as follows:

Group	Bird No.	Sex	Date	W.B.T.	Findings at Necropsy						<i>S. pullorum</i> Isolated
					Tube Test						
					10	20	40	80	160		
III	71596	Male	2/17	N	3	2	1	0	0	+	
V	71587	Male	2/18	N	4	3	2	0	0	+	

On March 11, Flock III was tested for the second time by both methods. A total of 227 birds was tested in approximately 4 hours. The technique for the whole blood test was identical with that employed on February 8. No reactors were detected by either method.

### Discussion

Among 260 tests for Group I, made with both methods, there was a disagreement of 17.31 per cent. The disagreements between the results of the two methods were observed throughout the testing period, most of them occurring when the serum titer of the bird was low. However, in some birds with high serum titers, the two tests did not always agree. Among the birds necropsied *S. pullorum* was isolated from 1 that reacted negatively to the whole blood test and positively to the tube test. This bird was at no time regarded as positive to the whole blood test. However, the titer at necropsy was less than 80. The disagreements between the tests of the two methods were not as numerous in

Group II as in Group I. Only 2.93 per cent of the total tests (209) disagreed, and these were confined to 3 birds with low titered sera.

It is probable that the percentage of disagreement between the results of the two methods could be reduced if the technique of the whole blood test were more refined. According to these limited observations, it appears that the dilution factor cannot be disregarded, since the thickness of the blood smear cannot be kept uniform, and the amount of antigen coming in contact with blood cannot be kept constant. These factors suggest an inconstant dilution which might be partly responsible for these variations. Also, temperatures near or below freezing in the poultry house at times appeared to have an unfavorable influence on the agglutination reaction.

The total number of tests made with both methods in the three flocks was 2,095. Ten tests included in this total were not classified. Of the remainder, 69 were positive, and 2,749 were negative by both methods; 17 were either doubtful to both methods or doubtful to one method and positive to the other; and 60 were negative to one method and either doubtful or positive to the other.

Of the birds represented in the latter two groups, 36 were necropsied. The following data show the number of necropsied birds classified as to their reactions to both methods at time of necropsy and the isolation of *S. pullorum*.

	<i>S. pullorum</i> Isolated	<i>S. pullorum</i> not Isolated
Positive to both tests.....	7	3
Negative to both tests.....	3	15
Doubtful to both tests.....	0	1
Negative to W.B.T. and doubtful to tube test.....	3	1
Negative to W.B.T. and positive to tube test.....	2	0
Positive to W.B.T. and negative to tube test.....	0	1
	<hr/> 15	<hr/> 21

*S. pullorum* was isolated from 15 of the 36 birds necropsied. Of this number, 3 were negative to both methods at the time of necropsy and 5 were negative to the whole blood method and either doubtful or positive to the tube method. The following birds, from which *S. pullorum* was isolated, did not react at any time to the whole blood test: 11853, 24854, 71596, 80278, 80328, and 80439. All but one of these birds possessed low titers.

*S. pullorum* was not isolated from 21 birds. Of this number, 9 at no time reacted to the tube method but did react to the whole blood method; 8 birds reacted to the tube method, but at no time reacted to the whole blood method.

While both testing methods failed to detect all infected birds, it appears that the whole blood test is less efficient than the tube test, as conducted in these investigations. The fact that the majority of disagreements between the two methods occurred with birds possessing low titers, suggests that a test is required in which the dilution can be fixed and maintained at a level which will detect such birds. The fact must be recognized that birds with low and fluctuating titers exist, and that when such birds are not detected in a testing program, failure in eradication may be anticipated.

Since the agglutination phenomenon is in reality the same for both methods, it appears that such a test as the whole blood test should not be expected to give reliable results when all steps in the technique do not remain constant. Investigations and comparative tests have shown that the degree of efficiency of the tube agglutination method was raised when the different phases in the technique were standardized and made uniform. It is possible that the degree of efficiency of the whole blood method might likewise be raised.



Furthermore, the interpretation of the reactions is no less difficult than in the tube method. As has been shown in these data, various types of reactions may occur so that a knowledge of the field of serology and other related fields is required. Therefore, a test of this nature should not be advocated as a simplified test which can be employed by persons who are not qualified to conduct such a test. Such action can lead only to retardation in eradication of the disease.

In recognizing the desirable features of the whole blood test, one must not lose sight of the fact that the real value of this method cannot be ascertained until it has been employed in an eradication program. If this method is found to be equally or more efficient than the tube method in detecting infected birds, then its adoption should be considered. At the present time, however, it appears that the whole blood method should not be considered as reliable as the tube method but that investigations concerning the former should be encouraged.

### Conclusions

1. Comparative tests employing the whole blood and tube agglutination methods revealed a greater efficiency in favor of the latter method.
2. *S. pullorum* was isolated from birds that had not reacted at any time to the whole blood test. In all but one of these cases, the birds possessed low titers.
3. Failure to detect infected birds with the whole blood method occurred most frequently with birds possessing low titers.
4. *S. pullorum* was isolated from three birds that were negative to both methods at the time of necropsy.
5. While the whole blood method has a diagnostic value, it does not appear as sensitive in detecting infected birds as the tube method.

### INTENSIVE TESTING VERSUS ANNUAL TESTING IN PULLORUM DISEASE ERADICATION

In eradicating pullorum disease from a flock of poultry, it is very important to select a testing program which will eliminate all infected birds in the shortest possible time. While very little literature is available comparing intensive and annual testing, investigators are generally agreed that a method of procedure involving some form of intensive testing is necessary to detect all infected birds in order to expedite eradication of the disease.

Newsom, Cross, and Ufford (67) by repeated tests on the same birds found that not all reacting hens are consistent reactors. Because of the inconsistency, they suggested the application of the tube agglutination test at frequent intervals, in order to detect all of the carrier birds. Kernkamp (54) also found that some reacting birds were of the intermittent type as shown by repeated tests. Because of this type of reactors, he regarded repeated testing as necessary to detect all reacting birds. Edwards and Hull (32), in 984 tests on 93 positive reacting birds tested over a period of one year, noted only 6 negative tests which were confined to 4 hens. They concluded that this type of reactor is not as common as reported by some investigators. Reports from the Massachusetts Agricultural Experiment Station (48, 92) advise retesting of infected flocks within the same season until negative. Dearstyne (24) reported a considerable percentage of intermittent reactors. Of 327 flocks in a program of intensive testing, 26 showed infection at the end of the sixth test, when the testing was discontinued. Dearstyne, Greaves, and Gauger (25) found a percentage of 26.8 intermittent reactors among 5,053 reactors under field conditions. Because it was impossible to detect all infected birds on one test, they advised the short interval testing plan. Bottorff (9) reporting the results of testing on six farms, found that from two to eight



monthly tests were necessary to obtain a negative test. He regarded retesting of a flock as advisable only when considerable breeding and trapnesting was being practiced.

### Source of Data

The data presented in this report were collected from the routine testing records of flocks in which intensive and annual testing procedures have been followed. Introduction of new stock, incomplete information as to number of birds tested as compared to the flock total, changing of testing procedure from year to year, and intermittent testing were factors which limited the selected number of flocks. The data apply to flocks whose testing histories were accurately known over a period of 2 consecutive years. The flocks selected were divided into five groups, with the basis for grouping as follows:

Group A—Intensive testing. Flock 100 per cent, i.e., all birds on premises, tested on each test, retested at intervals of 4 to 6 weeks, until negative.

Group B—Intensive testing. Flocks 100 per cent tested on each test, retested at intervals of 4 to 6 weeks, but not retested until negative.

Group C—Intensive testing, pen method. Flock 100 per cent tested on first test and infected pens retested at intervals of 4 to 6 weeks until negative.

Group D—Intensive testing, partial flock testing. Flock not 100 per cent tested, part of flock retested at intervals of 4 to 6 weeks, but not retested until negative.

Group E—Annual testing. Flock 100 per cent tested annually.

Table 26 shows the data concerning the different groups over a period of 2 years.

TABLE 26—SUMMARY OF COMPARATIVE DATA ON INTENSIVE AND ANNUAL TESTING FOR A PERIOD OF TWO YEARS

Year	Group	Flocks	Range in Flock Size	Total Birds Tested on Initial Test	Average Infection on Initial Test	Range in Infection on Initial Test	Negative Flocks
		<i>Number</i>		<i>Number</i>	<i>Per Cent</i>	<i>Per Cent</i>	<i>Number</i>
First.....	A	18	88- 2,722	15,806	3.15	0.13-27.34	—
	B	8	124- 2,926	7,306	7.02	1.89-23.34	—
	C	3	927- 3,875	7,130	0.14	0.09- 0.18	—
	D	11	169- 7,976	17,003	6.29	1.56-17.28	—
	E	15	177- 2,052	10,297	3.92	0.34-27.33	—
Second....	A	18	155- 3,707	19,073	0.00	0.00	18
	B	8	233- 3,351	8,268	0.18	0.00- 2.77	4
	C	3	1,147- 3,131	7,231	0.00	0.00	3
	D	11	174-10,411	22,307	3.76	0.00- 6.51	2
	E	15	185- 2,963	12,321	3.37	0.00-42.97	4

### Discussion

In comparing the average percentages of infection of the first year with those of the second year, it is evident that Groups A, B, and C, representing flocks in which an intensive testing procedure was followed, were more successful in eradicating the disease than Group E, in which the annual testing procedure was followed. While these intensive testing procedures were the most efficient, the results obtained were in direct ratio to the thoroughness and completeness of the procedure followed. Of the four groups that followed the intensive testing procedure, groups A, B, and C, which tested 100 per cent of the birds, were more successful in eradicating the disease than Group D, which practiced partial flock testing. Annual testing and partial flock testing of infected flocks, as shown, are of little value in the eradication of the disease. In Group A, first year, 8 flocks were negative on the second test, 5 on the third test, 4 on the fourth test, and 1 on the sixth test. In Groups B and D, first year, the maximum number

of tests received by any one flock was 4 and the minimum number of tests was 2. In Group C, first year, all flocks were negative on the second test. Of the 7,130 birds originally tested, 832 were retested. Although the pen method of testing appeared satisfactory for the 3 flocks reported here, it is not to be considered as efficient as the retesting of all birds on the premises.

While the eradication of pullorum disease is primarily dependent on the detection of all infected birds and their prompt removal from the breeding flock, full cooperation of the owner in carrying out eradication measures is necessary to prevent re-infection.

### Conclusions

From the data presented, it can be concluded that:

1. Intensive testing is more efficient than annual testing in the eradication of pullorum disease from a flock.
2. Testing of all the birds on the premises is more efficient than partial flock testing.
3. The most efficient testing procedure for the eradication of pullorum disease from a flock is (a) to test all birds in the flock on each test; (b) to retest at 4- to 6-week intervals until the flock has received at least one or more negative tests.

### TESTING RESULTS FOR THE 1931-32 SEASON

The testing data for the 1931-32 season show that the volume of work for this past year has been greater than in any previous testing season. A total of 483 applications for testing was received. Twenty-one flock owners cancelled their applications before the close of the season, and 462 submitted to the laboratory 421,895 blood samples, which were tested. Upon the laboratory's request, 61 owners submitted reacting birds for necropsy. Such necropsies are considered helpful in confirming the results of the agglutination test, especially in flocks previously negative which reveal one or two reactors, and in flocks which reveal only doubtful reactors. A few poultrymen, however, failed to comply; consequently it was impossible for the laboratory to report a satisfactory diagnosis as to the status of their flocks in regard to pullorum disease. Flock owners who fail to submit reacting birds requested for necropsy are given a positive testing report. In such cases the flock standing can be changed only by retesting the birds. Hence owners are advised to send the birds to the laboratory immediately upon receipt of the request, in order that the true pullorum-disease status of the flock may be determined. The amount of service rendered during the past year is shown in the following summary:

#### Summary of Service Rendered

Applications received . . . . .	483
Applications cancelled . . . . .	21
Flocks tested . . . . .	462*
Tests made . . . . .	421,895
Chickens:	
Routine . . . . .	402,677
Experimental . . . . .	18,184
Fowl other than chickens:	
Routine . . . . .	384
Experimental . . . . .	650
Owners receiving necropsy service . . . . .	61
Necropsies of reacting birds . . . . .	117**

\* Includes seven flocks of poultry other than chickens.

\*\* Credit is due to Dr. Glen L. Dunlap, who assisted with the necropsies of the reacting birds submitted to the laboratory.

TABLE 27—DISTRIBUTION OF TESTS AND REACTORS BY COUNTIES AND BY BREEDS

Breed	Barnstable	Berkshire	Bristol	Essex	Franklin	Hamptden	Hampshire	Middlesex	Norfolk	Plymouth	Suffolk	Worcester	Total	Positive Tests
Rhode Island Reds.....(Total tests (Positive tests	5,225 0	1,925 13	44,086 604	28,589 250	13,960 75	10,979 304	15,895 77	60,185 309	60,619 596	64,478 449	549 0	45,776 356	352,266 3,033	% 0.86
Barred Plymouth Rocks.....(Total tests (Positive tests	54 0	118 0	4,620 28	4,471 34	1,554 38	76 0	287 0	10,095 73	1,061 0	4,943 143	.....	1,328 18	28,607 334	1.17
White Plymouth Rocks.....(Total tests (Positive tests	.....	.....	1,060 0	943 93	279 2	.....	84 0	3,221 1	2,671 23	10,006 122	.....	671 0	18,935 241	1.27
White Leghorns.....(Total tests (Positive tests	.....	2,846 11	4,838 2	1,381 0	152 0	.....	170 0	138 0	2,571 63	431 29	.....	3,945 6	16,472 111	0.68
White Wyandottes.....(Total tests (Positive tests	.....	.....	46 0	625 0	.....	.....	19 0	764 0	1,162 33	960 1	.....	.....	3,576 34	0.95
Barnevelders.....(Total tests (Positive tests	.....	.....	.....	55 0	.....	.....	.....	247 0	.....	138 5	.....	.....	440 5	1.14
Miscellaneous.....(Total tests (Positive tests	6 0	..... .....	105 5	71 0	161 6	.....	72 8	2 0	.....	140 2	.....	8 0	565 21	3.72
Total tests.....	5,285	4,889	54,755	36,135	16,106	11,055	16,527	74,652	68,084	81,096	549	51,728	420,861	
Positive tests.....(number (per cent	0	24 0.49	639 1.17	377 1.04	121 0.75	304 2.75	85 0.51	383 0.51	715 1.05	751 0.93	0	380 0.74	3,779	0.90

### Distribution of Tests and Reactors

In Table 27 is given the distribution of tests and positive tests by breeds in each county. Birds were tested in 12 counties. Plymouth, Middlesex, and Norfolk Counties had the largest number of tests. Barnstable and Suffolk Counties had no positive tests, while 6 additional counties had less than 1 per cent positive tests.

Six breeds and others grouped as miscellaneous were tested. The Rhode Island Red is the predominating breed among those tested. Less than 1 per cent positive tests were found among the Rhode Island Red, White Leghorn, and White Wyandotte breeds.

The total number of tests among chickens was 420,861, of which 0.90 per cent were positive. The percentage of positive tests is the lowest attained in the testing history of this State.

### Tested Aves Other Than Chickens

During the past year, as shown in Table 28, 1,034 birds other than chickens were tested for 25 flock owners, 19 of whom also tested their chickens. In 5 of the chicken flocks, infection was detected. No reactors were found among the turkeys, pheasants, ducks, geese, guinea fowl, pigeons, and jungle fowl. Persons engaged in raising aves other than chickens are encouraged to have such birds tested in order to determine their importance in an eradication program.

TABLE 28—TESTED AVES OTHER THAN CHICKENS

Fowls	Females		Males		Total Tested
	Tested	Reactors	Tested	Reactors	
Turkeys	556	0	117	0	673
Pheasants	97	0	25	0	122
Ducks	69	0	13	0	82
Geese	64	0	14	0	78
Guinea fowl	35	0	11	0	46
Pigeons	30	0	—	—	30
Jungle fowl	—	—	3	0	3
Totals	851	0	183	0	1,034

### Number of Non-Reacting Flocks Increasing

Table 29 shows that the number of non-reacting flocks was 355 during the past season. Of this number, 180 were 100 per cent tested, representing 157,516 birds, and 175 were partially tested, representing 141,018 birds. In comparison with the previous season, the number of 100 per cent tested flocks has decreased and the number of partially tested flocks has increased in the non-reacting group. Every effort should be made to change this trend because the true disease status of a flock cannot be determined by testing only part of the flock. In order to determine that the flock is free from pullorum disease, it is necessary to test every bird on the premises annually. In the routine testing of flocks, infection is occasionally detected in flocks which were non-reacting previously. This may be expected to occur from time to time as long as the present conditions in poultry traffic and in the eradication of the disease are tolerated.

Plymouth and Middlesex Counties had the largest number of non-reacting flocks. All the flocks tested in Barnstable and Suffolk Counties were non-reacting. A total of 100 positive flocks was tested, of which 42 were 100 per cent tested and 58 were partially tested.

The data in Table 29 show that pullorum disease-free stock can be procured in each of the 12 counties. In order to expedite eradication of the disease, poultrymen should be advised to purchase from pullorum disease-free sources. In the majority of cases the local sources should prove to be the most advantageous from which to purchase stock.

TABLE 29—NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
<b>Non-reacting Flocks</b>						
Barnstable.....	2	1,859	4	3,426	6	5,285
Berkshire.....	3	3,660	1	835	4	4,495
Bristol.....	18	17,252	35	22,779	53	40,031
Essex.....	13	11,242	22	19,031	35	30,273
Franklin.....	13	11,703	4	1,438	17	13,141
Hampden.....	7	4,134	4	2,223	11	6,357
Hampshire.....	20	11,080	4	2,917	24	13,997
Middlesex.....	23	26,235	32	31,249	55	57,484
Norfolk.....	14	8,164	22	21,091	36	29,255
Plymouth.....	38	38,988	25	14,737	63	53,725
Suffolk.....	1	549	—	—	1	549
Worcester.....	28	22,650	22	21,292	50	43,942
Total.....	180	157,516	175	141,018	355	298,534
<b>Positive Flocks</b>						
Barnstable.....	—	—	—	—	—	—
Berkshire.....	1	394	—	—	1	394
Bristol.....	7	3,499	10	8,053	17	11,552
Essex.....	1	443	8	5,397	9	5,840
Franklin.....	7	2,228	—	—	7	2,228
Hampden.....	3	1,867	1	464	4	2,331
Hampshire.....	4	1,420	—	—	4	1,420
Middlesex.....	5	1,872	16	10,448	21	12,320
Norfolk.....	3	17,865	6	5,625	9	23,490
Plymouth.....	8	2,841	10	10,025	18	12,866
Suffolk.....	—	—	—	—	—	—
Worcester.....	3	1,376	7	4,840	10	6,216
Total.....	42	33,805	58	44,852	100	78,657

### Annual Testing Necessary to Determine Flock Status

Annual testing of a flock is necessary in order to determine the exact disease status because the fact that a flock is once free of the disease does not assure the owner that infection will not be re-introduced. The testing of a flock is a means of disease detection and not a means of prevention. The testing is only a part of a disease eradication program. In Table 30 are given the results from flocks tested for the first time, those tested intermittently, and those tested annually. In the latter group, 269 flocks were tested three or more consecutive years. The percentage of positive tests was 0.46 for these 269 flocks. This is less than the percentages of positive tests observed in the other three groups. It is clearly evident, as determined from the results which are presented here, that annual testing should no longer be regarded as a questionable measure in a sound eradication program. It is also recognized that when a testing program is adopted to eradicate the disease from a flock, intensive testing is more effective than annual testing, as is reported elsewhere in this publication.

TABLE 30—ANNUAL TESTING VERSUS SINGLE AND INTERMITTENT TESTING

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Per cent	100% Tested	Partially Tested	100% Tested	Partially Tested
Tested for the first time.....	93	26,061	29,507	1,496	5.07	35	24	17	17
Intermittent testing history.....	33	16,709	17,303	361	2.09	11	13	4	5
Tested for two consecutive years	60	35,476	39,352	385	0.98	25	21	4	10
Tested for three or more consecutive years.....	269	298,945	334,699	1,537	0.46	109	117	17	26
Totals.....	455	377,191	420,861	3,779	0.90	180	175	42	58

## Progress in Eradication

In Table 31 are given the comparative results of the past two seasons of testing. Increases are observed in the number of tested flocks, birds, and tests. Nine counties show a reduction in the percentage of positive tests. Six counties show an increase and seven a decrease in the number of tested flocks. The

TABLE 31—COMPARISON OF 1930-31 AND 1931-32 TESTING

County	Flocks	Birds	Tests	Positive Tests Per Cent	Non-Reacting Flocks
<b>1930-31 Season</b>					
Barnstable.....	10	6,819	6,819	0.01	9
Berkshire.....	14	8,326	8,385	1.31	11
Bristol.....	60	45,167	53,126	1.73	40
Dukes.....	1	51	51	3.92	—
Essex.....	41	30,593	30,593	1.63	33
Franklin.....	13	13,096	13,917	0.61	12
Hampden.....	19	8,623	9,086	2.91	11
Hampshire.....	31	17,153	17,153	0.51	28
Middlesex.....	68	69,086	78,577	1.55	46
Norfolk.....	54	52,726	62,927	2.15	40
Plymouth.....	83	58,356	71,151	1.36	60
Worcester.....	53	46,814	51,198	0.78	38
Totals.....	447	356,810	402,983	1.47	328
<b>1931-32 Season</b>					
Barnstable.....	6	5,285	5,285	0.00	6
Berkshire.....	5	4,889	4,889	0.49	4
Bristol.....	70	51,583	54,755	1.17	53
Essex.....	44	36,113	36,135	1.04	35
Franklin.....	24	15,369	16,106	0.75	17
Hampden.....	15	8,688	11,055	2.75	11
Hampshire.....	28	15,417	16,527	0.51	24
Middlesex.....	76	69,804	74,652	0.51	55
Norfolk.....	45	52,745	68,084	1.05	36
Plymouth.....	81	66,591	81,096	0.93	63
Suffolk.....	1	549	549	0.00	1
Worcester.....	60	50,158	51,728	0.74	50
Totals.....	455	377,191	420,861	0.90	355

number of non-reacting flocks increased in seven counties, decreased in three, and remained the same in one. It is encouraging to note that the percentage of positive tests has decreased to less than 1 per cent and also that the number of non-reacting flocks is increasing.

### SUGGESTIONS FOR THE ESTABLISHMENT AND MAINTENANCE OF PULLORUM DISEASE-FREE FLOCKS

The efficiency and effectiveness of an eradication program are directly proportional to the soundness of the eradication measures adopted and the manner in which they are carried out. While it is true that programs should be designed to satisfy local conditions, yet the fundamental disease eradication principles must be identical for all localities. Although progress has been made in certain states, there is still an urgent need for improvement and standardization of some phases in the eradication of this disease, in order to promote a sound program. Those concerned with eradication will agree that only the most reliable diagnostic test or tests should be employed. These should be adopted as the standard and the official test or tests. Furthermore, only persons trained in the proper field of work and competent to employ and to interpret such diagnostic tests should be permitted to assume responsibility in an eradication program. In some states elaborate programs are designed, but in actual practice, important phases are sadly neglected. Control officials should be reluctant to accept testing results from other states until a thorough investigation has been made, not only of the printed program, but especially of the manner in which the program is operated.

In the majority of states, tested flocks are classified as to their disease status. Although some controversy still exists, the majority of disease control officials agree as to what shall constitute a pullorum disease-free flock, as determined by the agglutination test. The most general regulation in establishing a disease-free flock, is that the entire flock must pass two consecutive negative tests not less than six months nor more than a year apart. Experience has shown that flocks which have satisfied this requirement seldom, if at all, retain the infection. In classifying flocks as to their disease status, there are in reality only two classes of flocks, namely, infected and non-infected. The latter is accepted as the safer for breeding purposes. The infected group is further sub-divided in some localities which maintain a distinction between untested flocks and tested infected flocks. Some states even go so far as to classify flocks on the amount of infection detected. It does not appear expedient to recognize and tolerate certain limits of infection because as long as the disease exists in the flock, any degree of trouble may be expected in the progeny of such a flock. An effort should be made to encourage poultrymen in every way possible to establish pullorum disease-free flocks. Hence a term for pullorum disease-free flocks is highly desirable in order that poultrymen may identify such flocks with the least amount of trouble and uncertainty. The term "(Name of State) Accredited—Pullorum Disease-Free" should be adopted to designate flocks free of this disease. Furthermore, the term used to designate a pullorum disease-free flock should stand by itself and not be masked by terms that designate breeding or laying qualities of a flock. The average poultryman today is confronted with a glossary of terms which is confusing and misleading to him. Present circumstances suggest a revision and standardization of such terms.

An effort should also be made to prohibit misleading or false advertising concerning flocks. Official lists of pullorum disease-free flocks should be made available to the public. Such lists will enable poultrymen to locate stock free of this disease, as well as stimulate eradication efforts.



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MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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Control Series

Bulletin No. 64

September, 1932

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Inspection of Commercial  
Feedstuffs

By Philip H. Smith

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This is the thirty-eighth report of the work of feeding stuffs inspection and presents the results of the chemical and microscopic analyses on 1607 samples of feeding stuffs intended for live stock and poultry consumption, collected during the year ending September 1, 1932.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.

## INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith<sup>1</sup>

During the past year, 1,023 brands of feed have been registered for sale by 230 manufacturers and dealers; 1,607 samples of feeding stuffs have been collected and subjected to analysis; 135 dealers located in 79 towns and cities have been visited by the feed inspector at least once.

The intent of the Feeding Stuffs Act is primarily to prevent deception and misrepresentation in the sale of commercial feeding stuffs. *It does not, however, prohibit the sale of inferior feeds* unless the feed is actually injurious to live stock and poultry. A "true label" giving the information required by statute enables the feeder to purchase wisely of those products best adapted to his own needs.

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<sup>1</sup>The following staff members assisted in the inspection: Albert F. Spelman, George Larsinos and John W. Kuzmeski, Chemists; Frederick A. McLaughlin, Microscopist, James T. Howard, Inspector, Cora B. Grover, Clerk.



Complete Average Analyses of Feeds Collected (Per Cent).  
I. UNMIXED BY-PRODUCTS.  
(a) *Protein Feeds.*

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Guar- anteed.		Guar- anteed.			Guar- anteed.		
				Found.		Found.			Found.		
Cottonseed Meal.											
5	Empire High Grade	E. T. Allen Co.	7.1	42.1	41.0	6.9	6.0	28.7	9.1	10.0	6.1
1	Monarch Brand Prime	Ashcraft-Wilkinson Co.	6.2	44.3	43.0	7.8	6.0	27.1	7.4	10.0	7.2
10	Helmet Brand Prime	Ashcraft-Wilkinson Co.	7.3	42.4	41.0	6.7	5.5	28.1	9.1	10.0	6.4
4	Paramount Brand Prime	Ashcraft-Wilkinson Co.	7.4	38.5	36.0	5.8	5.0	30.7	12.3	14.0	5.3
2	"Owl Brand" Prime 41% Protein	F. W. Brode Corp.	6.6	42.1	41.0	6.0	5.0	28.3	9.1	10.0	7.9
1	Buckeye Prime	Buckeye Cotton Oil Co.	6.2	41.9	41.0	6.0	6.5	29.5	10.8	10.0	5.6
1	Buckeye 36%	Buckeye Cotton Oil Co.	7.6	37.0	36.0	4.9	5.0	31.4	14.3	14.0	4.8
5	Miss Cairo Brand Prime Quality	Cairo Meal and Cake Co.	7.2	37.8	36.0	6.2	5.0	31.8	10.9	12.0	6.1
1	Steerboy Brand 43% Protein Prime Quality	S. P. Davis	6.0	43.1	43.0	7.9	6.0	27.3	8.2	10.0	7.5
7	Goodluck Brand 41% Prime Quality	S. P. Davis	6.9	42.5	41.0	7.6	6.0	27.5	9.3	10.0	6.2
2	Eastern States Choice	Eastern States Farmers' Exchange	7.0	41.2	41.0	6.0	6.0	28.4	9.6	10.0	7.8
1	Bull Brand	Humphreys-Godwin Co.	8.2	44.4	43.0	6.1	5.0	26.7	9.1	11.0	5.5
11	Dixie Brand 41% Protein Prime	Humphreys-Godwin Co.	7.4	41.4	41.0	6.6	5.0	27.7	9.4	12.0	7.5
6	Danish Brand	Humphreys-Godwin Co.	8.0	37.2	36.0	5.8	5.0	30.7	12.5	15.0	5.8
1	"Pinta," Columbus Brand	Dan Joseph Co.	7.3	44.1	41.0	6.7	6.0	28.7	7.5	10.0	5.7
1	"Lovit Brand," 36%	L. B. Lovitt & Co.	6.4	38.1	36.0	5.4	5.0	32.4	12.4	15.0	5.3
1	White Mule Brand	Marianna Sales Co.	7.6	37.0	36.0	5.7	5.0	31.8	12.9	14.0	5.0
1	(41% Protein)	Purina Mills	7.1	41.2	41.0	7.1	6.5	30.5	7.6	11.0	6.5
3	RMC 41%	Rach Milling Co.	7.4	42.2	41.0	7.0	5.0	27.7	8.7	14.0	7.0
Linseed Meal.											
2	Pure Old Process 37% Protein	Archer-Daniels-Midland Co.	9.0	39.0	37.0	4.7	4.5	35.2	7.2	9.0	4.9
5	Pure Old Process 34% Protein	Archer-Daniels-Midland Co.	8.9	37.3	34.0	5.4	5.0	35.6	7.5	9.0	5.3
3	Pure Old Process 32% Protein	Archer-Daniels-Midland Co.	8.8	34.1	32.0	5.9	5.0	37.7	8.3	9.0	5.2
2	Old Process	Bisbee Linseed Co.	8.6	35.3	34.0	7.0	5.0	33.7	7.7	10.0	7.7
1	"Maple Leaf" Oilcake Meal	Canada Linseed Oil Mills, Ltd.	8.9	40.5	38.0	6.0	5.0	33.7	6.8	9.0	4.1
1	Pure Old Process	Hirst & Begley Linseed Works	8.0	37.7	37.0	6.5	5.0	35.9	7.2	9.0	4.7
8	"K & M" Brand Pure Old Process	Kelloggs & Miller, Inc.	8.7	37.8	34.0	6.0	5.0	35.4	7.3	9.0	4.8

**Complete Average Analyses of Feeds Collected (Per Cent)—Continued.**  
**I. UNMIXED BY-PRODUCTS—Continued.**  
**(a) Protein Feeds—Continued.**

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
7	<b>Linseed Meal—Concluded.</b>										
1	Kellogg's 37% Protein Pure Old Process	Spencer Kellogg & Sons, Inc.	9.0	39.9	37.0	5.7	5.0	34.0	6.5	10.0	4.9
2	The Mann Bros. Co. 37% Protein Pure Old Process	Mann Bros. Co.	9.5	38.4	37.0	6.7	6.0	30.3	6.6	10.0	8.5
2	The Mann Bros. Co. 34% Protein Pure Old Process	Mann Bros. Co.	9.2	39.1	34.0	7.1	6.1	33.8	6.5	10.0	4.3
2	Screwpress Linseed Oil Cake Meal	Sherwin-Williams Co. of Canada, Ltd.	5.8	42.2	35.0	8.7	6.5	32.7	6.1	8.0	4.5
3	<b>Oil Cake Meals.</b>										
2	Soybean Oil Meal	Archer-Daniels-Midland Co.	7.7	43.7	40.0	5.4	4.5	33.3	5.2	7.0	4.7
2	Shellabarger Soy Bean Meal	Shellabarger Grain Products Co.	7.8	40.6	41.0	5.7	4.5	34.0	6.9	7.5	5.0
1	Staley's Soy Bean Meal	A. E. Staley Manufacturing Co.	10.1	42.7	41.0	4.5	4.5	33.0	5.4	7.0	4.3
2	<b>Gluten Meal.</b>										
16	Amazo	American Maize-Products Co.	8.7	48.0	40.0	2.2	1.0	37.6	2.4	4.0	1.1
4	Diamond	Corn Products Refining Co.	8.6	45.0	40.0	1.7	1.0	41.7	1.5	4.0	1.5
2	Douglas	Penick & Ford Ltd., Inc.	8.7	43.5	40.0	1.7	1.0	39.2	3.7	4.0	3.2
2	Union	Union Starch & Refining Co.	7.4	43.7	40.0	2.3	1.0	41.1	2.1	4.0	3.4
3	<b>Gluten Feed.</b>										
9	Cream of Corn	American Maize-Products Co.	8.2	31.2	23.0	3.1	2.0	44.1	7.3	8.5	6.1
3	Bacon's	E. R. Bacon Grain Co.	7.9	27.5	23.0	2.9	2.0	51.1	6.4	8.0	4.2
14	Clinton	Clinton Corn Syrup Refining Co.	11.3	26.8	23.0	2.6	2.0	47.7	6.4	8.5	5.2
1	Buffalo	Corn Products Refining Co.	10.4	26.8	23.0	2.5	2.0	47.6	7.0	8.5	5.7
9	Heavy Buffalo Corn Gluten Feed	Corn Products Refining Co.	10.6	21.5	20.0	1.7	1.0	55.4	6.3	7.0	4.5
1	Douglas	Penick & Ford Ltd., Inc.	10.8	26.4	23.0	2.2	2.0	45.7	7.6	8.5	7.3
13	Sweetened Douglas	Penick & Ford Ltd., Inc.	11.5	26.4	20.0	2.0	1.5	45.7	7.7	8.0	6.7
2	Staley's	A. E. Staley Manufacturing Co.	10.2	27.6	23.0	1.7	1.0	48.6	6.0	8.0	5.9
2	Union	Union Starch & Refining Co.	10.6	30.2	23.0	2.3	1.0	44.9	6.1	8.0	5.9

[illegible]

\*With screenings.

## Complete Average Analyses of Feeds Collected (Per Cent)—Continued.

## I. UNMIXED BY-PRODUCTS—Continued.

## (a) Protein Feeds—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.	
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.		
Wheat Standard Middlings— Concluded.												
1	Lucky Hard Wheat Middlings	Federal Mill, Inc.	9.8	18.0	15.0	4.7	4.5	57.5	6.2	9.5	3.8	
1	Dairy Maid Soft Winter Wheat Middlings	Federal Mill, Inc.	9.2	15.7	13.0	4.6	4.5	60.6	6.2	8.0	3.7	
1	*Washburn's Gold Medal Hard Wheat Standard Middlings	General Mills, Inc.	9.7	18.7	15.0	5.8	4.0	53.4	7.9	9.5	4.5	
2	"Hanco" Brand Wheat Shorts	Frank B. Ham & Co., Ltd.	10.4	17.8	15.0	5.4	3.5	55.8	6.4	10.5	4.2	
1	*Wheat Standard Middlings	Hecker-Jones-Jewell Milling Co.	9.4	19.4	15.0	5.6	4.75	53.8	7.2	9.5	4.6	
2	*Blackhawk Wheat Standard Middlings	International Milling Co.	9.6	18.6	16.0	5.2	4.5	54.0	7.8	8.5	4.8	
1	*Big B Wheat Middlings	Moseley & Motley Milling Co.	9.2	20.5	15.0	5.9	4.5	49.2	6.7	9.0	8.5	
3	Namico Wheat Middlings	National Milling Co.	9.1	16.8	15.0	4.8	3.5	59.0	6.4	9.0	3.9	
2	*Niagara Standard Wheat Middlings	Niagara Falls Milling Co.	10.2	19.2	15.5	5.9	4.5	53.3	7.2	7.0	4.2	
1	*Red Turkey Wheat Flour Middlings	Ontario Milling Co., Inc.	10.6	19.4	16.0	4.8	4.0	54.4	6.1	6.0	4.7	
2	*Pillsbury's Hard Wheat Standard B Middlings	Pillsbury Flour Mills Co.	9.9	17.1	15.0	5.3	4.0	54.6	8.2	9.5	4.9	
1	Bell Cow Shorts	Quaker Oats Co.	9.5	18.1	15.0	5.8	4.0	55.8	6.8	8.0	4.0	
1	Superior Wheat Shorts	Robin Hood Mills, Ltd.	10.0	19.3	17.0	6.0	5.0	52.6	6.8	8.0	5.3	
4	Hard Wheat Occident Standard Middlings	Russell-Miller Milling Co.	9.8	19.8	15.0	6.4	4.0	51.3	7.8	9.5	4.9	
1	Pioneer Wheat Shorts	Western Canada Flour Mills, Ltd.	11.4	18.4	16.0	5.8	5.0	54.4	6.2	8.0	3.8	
Wheat Mixed Feed.												
2	Prize Mixed Feed	C. W. Brister & Son	10.5	15.5	14.0	4.4	3.5	57.6	7.0	9.0	5.0	
2	Courcy's Heavy Mix Feed and Cal-cate Flour	Nicolas Courcy	9.9	17.5	16.0	4.8	4.5	57.2	6.1	7.0	4.5	
6	Coweco Heavy Mixed Feed	E. A. Cowee Co.	10.1	16.0	15.0	4.1	4.0	59.5	5.9	7.0	4.4	
1	King Wheat Feed	Cutler Co.	9.2	17.7	15.0	5.0	4.5	57.8	6.1	8.0	4.2	
1	Full Value Mixed Feed	J. L. Dunnell & Son	10.4	17.9	15.0	4.4	5.0	56.6	5.9	6.0	4.8	



## Complete Average Analyses of Feeds Collected (Per Cent)—Continued.

## I. UNMIXED BY-PRODUCTS—Concluded.

## (a) Protein Feeds—Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.		Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.			Found.	Guar- anteed.	
		<b>Wheat Bran—Concluded.</b>										
1	Hard Wheat Occident Bran . . .	Russell-Miller Milling Co. . .	10.5	18.2	14.0	5.5	4.0	51.1		8.7	11.5	6.0
1	*Wheat Bran . . .	Shellabarger Mill & Elevator Co. . .	9.6	18.0	14.5	4.2	3.5	50.7		10.0	11.0	7.5
1	Try Me Bran . . .	Sparks Milling Co. . .	10.3	17.2	15.0	4.0	3.5	54.0		8.5	10.0	6.0
2	Bran . . .	F. W. Stock & Sons . . .	12.0	18.2	16.0	4.4	3.0	53.5		7.0	10.0	4.9
1	*Wheat Bran . . .	George Urban Milling Co. . .	9.9	17.8	14.0	4.3	3.5	54.6		8.4	12.0	5.0
1	Victor Spring Wheat Bran . . .	Victor Flour Mills, Inc. . .	8.7	18.2	15.0	5.1	4.0	52.4		9.1	11.0	6.5
1	Pioneer Wheat Bran . . .	Western Canada Flour Mills, Ltd. . .	8.7	16.7	14.0	5.8	3.5	52.5		10.7	12.0	5.6

## (b) Starchy Feeds.

				Found.	Guar- anteed.	Found.	Guar- anteed.			Found.	Guar- anteed.	
		<b>Hominy Feed.</b>										
3	Homco . . .	Decatur Milling Co., Inc. . .	9.2	11.6	10.0	9.0	7.0	61.4		5.1	6.0	3.7
2	Emco . . .	Evans Milling Co. . .	8.4	12.8	10.0	8.5	6.0	59.8		5.5	6.0	5.0
7	White . . .	Kellogg Co. . .	8.8	11.4	10.0	7.2	6.0	66.5		3.8	5.0	2.3
3	Hexite Sweet Hominy . . .	Kellogg Co. . .	7.6	10.7	9.0	5.5	4.0	70.5		2.7	3.5	3.0
1	O-Corn-O . . .	Kellogg Co. of Canada, Ltd. . .	7.9	11.9	10.0	9.4	6.5	64.1		4.4	5.0	2.3
3	Badger White . . .	Chas. A. Krause Milling Co. . .	9.7	11.3	10.0	6.6	6.0	65.8		4.0	5.0	2.3
2	Choice Steam Cooked . . .	Miner-Hillard Milling Co. . .	10.4	11.3	10.0	6.4	5.0	66.1		3.4	5.0	2.4
1	Poco . . .	Mt. Vernon Milling Co. . .	9.2	11.8	10.0	8.0	7.0	63.3		4.0	6.0	3.7
5	Burt's . . .	Postum Co., Inc. . .	9.5	11.6	10.0	7.5	6.0	61.8		3.8	5.0	2.6
1	Pratt's Yellow . . .	Pratt Food Co., Inc. . .	10.5	11.4	10.0	5.8	4.0	66.1		3.8	6.0	2.4
6	White . . .	Quaker Oats Co. . .	9.4	11.2	9.5	6.9	4.0	66.2		4.2	5.0	2.1
3	Yellow . . .	Quaker Oats Co. . .	8.8	11.6	9.5	6.8	4.0	65.4		4.1	5.0	3.3
5	Paragon . . .	St. Albans Grain Co. . .	9.3	11.7	10.0	7.1	6.0	65.6		3.9	7.0	2.4
		<b>Dried Beet Pulp.</b>										
9	—	Larowe Milling Co. . .	9.2	9.1	8.0	0.7	0.5	58.8		19.7	22.0	2.5
1	Dried Molasses-Beet Pulp . . .	Larowe Milling Co. . .	9.2	11.2	8.0	0.6	0.5	60.8		15.3	20.0	2.9

## Rye Feed.

5	Upper Hudson	Upper Hudson Rye flour Mills, Inc.	9.3	17.5	13.5	3.5	3.0	61.7	4.8	6.0	3.2
<b>Oat Feed.</b>											
2	Vim Feed	Quaker Oats Co.	6.7	6.9	5.0	2.4	2.0	50.9	27.4	30.0	5.7
6	Sugared Vim Feed	Quaker Oats Co.	7.7	5.4	5.0	1.8	1.25	54.3	25.1	26.0	5.7
<b>Barley Feed.</b>											
2	—	H. C. Knoke & Co.	8.3	17.0	14.0	4.6	3.0	57.3	8.6	13.5	4.2
<b>Corn Feed Meal.</b>											
1	—	Dewey Bros. Co.	10.8	12.4	9.0	10.7	4.5	56.4	6.7	5.0	3.0

II. PREPARED FEEDS.  
(a) Protein Feeds.

<b>Dairy and Molasses Feeds (more than 15 per cent protein).</b>											
1	Amco 24% Dairy Ration	Allied Mills, Inc.	10.4	21.5	24.0	3.6	3.5	50.6	5.9	9.0	5.0
2	Amco 20% Dairy Ration	Allied Mills, Inc.	10.4	20.8	20.0	3.7	3.5	53.8	6.3	9.0	5.0
2	Amco 20% National Dairy Ration	Allied Mills, Inc.	9.9	21.9	20.0	4.1	3.5	50.5	7.0	9.0	6.6
1	Wayne 20% Supreme Dairy Feed	Allied Mills, Inc.	9.9	20.5	20.0	5.2	3.5	46.7	9.5	12.5	8.2
1	Amco 16½% Sucrose Dairy Ration	Allied Mills, Inc.	10.6	19.1	16.5	4.0	3.5	51.7	9.1	12.0	5.5
1	24% Milk Maker	A. P. Ames Co.	9.4	25.8	24.0	4.2	5.0	43.2	7.9	10.0	7.5
1	20% Balanced Ration	A. P. Ames Co.	10.3	21.7	20.0	4.5	4.5	49.2	7.2	9.0	7.1
1	Master Grain Ration	Arady Farms Milling Co.	8.4	23.9	21.0	5.1	4.5	46.5	11.0	11.0	5.1
1	Milkers' Ready Ration	Arady Farms Milling Co.	9.6	22.4	22.0	3.7	4.0	47.2	9.6	12.0	7.5
2	Old Colony Feed	Arady Farms Milling Co.	9.3	22.0	20.0	4.1	3.5	50.6	8.4	11.0	5.6
3	Sweet 16 Dairy Feed	Arady Farms Milling Co.	9.9	17.1	16.0	6.0	4.0	46.7	12.0	12.5	8.3
1	More-Value 24% Ration	Associated Farmers' Exchanges, Inc.	8.8	25.0	24.0	4.3	4.0	49.7	7.7	10.0	4.5
6	Mune-May-Ker 24% Dairy Ration	Associated Farmers' Exchanges, Inc.	8.5	27.0	24.0	4.8	4.0	47.5	7.2	8.0	5.0
9	More-Value 20% Dairy Ration	Associated Farmers' Exchanges, Inc.	8.9	22.7	20.0	4.1	3.5	52.0	7.3	10.0	5.0
9	Mune-May-Ker 20% Dairy Ration	Associated Farmers' Exchanges, Inc.	8.8	23.5	20.0	4.5	4.0	51.4	6.9	8.0	4.9
3	Beacon Sweet "24"	Beacon Milling Co., Inc.	9.4	25.2	24.0	4.7	4.0	46.9	8.0	9.0	5.0
3	Beacon Sweet "20"	Beacon Milling Co., Inc.	6.6	21.3	20.0	4.8	4.5	55.9	6.4	9.0	5.0
2	Beacon Dairy Ration	Beacon Milling Co., Inc.	8.7	24.5	21.0	4.7	4.0	47.0	8.6	9.0	6.5
1	Auburn Dairy Feed	Beacon Milling Co., Inc.	9.9	21.2	20.0	4.0	4.0	49.8	8.2	10.0	6.9
1	Beacon "20"	Beacon Milling Co., Inc.	8.8	21.7	20.0	5.1	4.5	50.3	8.1	9.0	5.9
2	Green Mountain Dairy Ration	Berkshire Coal & Grain Co., Inc.	8.9	24.5	23.0	5.1	5.0	47.1	9.1	10.0	5.3
1	Berkshire Hills Sweet Dairy Feed	Berkshire Coal & Grain Co., Inc.	8.7	23.1	20.0	4.4	4.0	47.4	10.1	10.0	6.3
3	Bidwell 24% Dairy Ration	Black Rock Milling Corp.	10.1	24.7	24.0	4.1	4.0	49.3	6.8	11.0	5.0
2	Bidwell 20% Dairy Ration	Black Rock Milling Corp.	11.3	20.1	20.0	4.1	4.0	52.2	6.7	11.0	5.6

\*With screenings.



Complete Average Analyses of Feeds Collected (Per Cent)—Continued.  
 II. PREPARED FEEDS—Continued.  
 (a) Protein Feeds—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Dairy and Molasses Feeds (more than 15 per cent protein)—(Cont.)</b>										
2	Borden's Dairy Feed	Borden Grain Co.	9.0	24.7	22.0	5.9	4.5	48.1	7.0	9.0	5.3
1	Brown's Dairy Feed	Geo. B. Brown	8.3	21.8	20.0	4.5	4.0	48.3	10.5	12.0	6.6
2	Community 20% Dairy Ration	Community Feed Stores, Inc.	9.0	21.4	20.0	4.9	4.5	51.8	7.7	12.5	5.2
2	Hilltop 20% Dairy Ration	Community Feed Stores, Inc.	8.6	21.7	20.0	4.5	4.0	48.4	10.8	12.5	6.0
2	Eastern Dairy Feed	Nicolas Courcy	10.1	23.8	22.0	4.9	4.5	49.7	5.4	7.0	6.1
2	Coweco 1925 Ration	E. A. Cowee Co.	9.7	24.5	24.0	4.8	4.5	47.2	8.0	10.0	5.8
3	Coweco 20% Ration	E. A. Cowee Co.	10.4	21.7	20.0	4.0	4.0	52.5	6.6	10.0	4.8
1	Coweco 10-Price 20% Dairy Ration	E. A. Cowee Co.	9.9	23.1	20.0	4.4	3.5	51.2	6.2	9.0	5.2
1	Crystal 24% Dairy Ration	Curley Brothers	8.9	27.0	24.0	4.9	5.0	46.6	6.7	9.0	5.9
1	Crystal Dairy 20 Ration	Curley Brothers	9.5	23.2	20.0	4.8	4.0	48.8	7.8	12.0	5.9
2	Diamond A Dairy Feed	J. Cushing Co.	8.6	27.2	24.0	4.7	5.0	45.0	9.1	8.0	5.4
1	Quality 24% Dairy	J. Cushing Co.	9.7	25.9	24.0	4.5	4.0	46.5	7.1	11.0	6.3
3	Big C Special Dairy Feed	J. Cushing Co.	9.1	24.1	21.0	5.5	5.0	48.4	7.5	9.0	5.4
3	Diamond C Dairy Feed	J. Cushing Co.	9.4	24.7	21.0	4.6	5.0	49.1	8.2	11.0	4.0
2	Quality 20% Dairy Feed	J. Cushing Co.	10.5	21.0	20.0	4.4	4.0	49.5	7.8	10.0	6.8
1	Sweet 20 Dairy Feed	J. Cushing Co.	8.9	22.8	20.0	4.1	3.0	49.0	9.8	15.0	5.4
3	Vigor 16% Dairy	J. Cushing Co.	9.6	18.7	16.0	3.7	3.0	50.7	9.6	11.0	7.7
1	King 20 Dairy Feed Sweetened	Culter Co.	9.4	22.2	20.0	4.4	4.0	51.7	7.1	8.5	5.2
1	King Dairy Feed with Beet Pulp Sweetened	Culter Co.	9.6	22.8	20.0	4.4	4.0	50.3	7.9	11.0	5.0
4	Delco 24% Dairy Feed	Delaware Mills, Inc.	9.5	25.6	24.0	5.3	5.0	46.9	7.7	10.0	5.0
4	Delco 20% Dairy Feed	Delaware Mills, Inc.	8.7	22.5	20.0	4.6	4.0	48.5	11.0	11.0	4.7
2	Diehl's Dairy Feed	F. Diehl & Son, Inc.	8.6	20.4	18.0	4.6	3.0	50.6	10.0	14.0	5.8
1	Excel Dairy Ration 24%	J. L. Dunnell & Son	9.2	24.8	24.0	4.4	5.0	47.1	8.2	10.0	6.3
1	Excel 20% Dairy Ration	J. L. Dunnell & Son	11.6	20.3	20.0	4.7	4.5	49.0	8.3	10.0	6.1
1	Eastern 24% Dairy Feed Sweetened	Eastern Grain Co.	10.8	24.9	24.0	5.1	4.0	45.9	7.6	8.0	5.7
3	Eastern 20% Dairy Feed Sweetened	Eastern Grain Co.	10.7	21.7	20.0	4.9	4.0	49.3	7.2	8.0	6.2
1	Eastern All-Purpose Dairy Feed	Eastern Grain Co.	9.5	16.7	15.0	3.7	3.2	52.4	12.8	15.0	4.9
3	Eastern States Milkmore Dairy Ration	Eastern States Farmers' Exchange	9.5	25.6	24.0	4.9	4.5	48.3	6.7	8.0	5.0

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4	Eastern States Fulpal Dairy Ration	Eastern States Farmers' Exchange	22.2	20.0	4.8	4.5	51.6	6.8	8.0	5.2
4	Eastern States Dightland 20	Eastern States Farmers' Exchange	21.0	20.0	4.3	4.0	49.3	10.7	12.0	5.1
4	Eastern States Sixteen	Eastern States Farmers' Exchange	18.2	16.0	4.3	4.0	53.3	7.9	8.0	6.3
1	Eastern States Highland 16	Eastern States Farmers' Exchange	18.9	16.0	4.1	3.5	52.5	10.1	11.0	4.9
1	The Ellis Dairy Feed	Michael W. Ellis	25.8	22.0	4.6	4.0	47.6	6.5	9.0	5.7
5	Elmore Milk Grains	Elmore Milling Co., Inc.	28.1	25.0	5.1	5.0	43.4	9.3	11.0	5.2
2	Elmore's Economy 24% Dairy Feed	Elmore Milling Co., Inc.	25.4	24.0	4.9	4.0	44.7	8.8	10.0	6.8
2	Economik Dairy Feed	Elmore Milling Co., Inc.	25.4	24.0	5.1	4.0	46.8	8.4	11.0	8.0
4	Osego Economy Ration	Elmore Milling Co., Inc.	22.6	20.0	4.9	4.0	47.4	9.1	11.0	6.6
4	Elmore's Sweet Digesto Dairy Feed	Elmore Milling Co., Inc.	17.5	16.0	4.0	4.0	49.4	13.5	12.0	7.3
2	Eselman Red Rose 24 Dairy Feed	John W. Eselman & Sons	26.6	24.0	4.0	4.0	47.1	6.9	11.0	6.4
1	Eselman Conestoga 20 Dairy Feed	John W. Eselman & Sons	22.5	20.0	4.4	4.0	50.9	7.5	11.0	4.8
1	Eselman Certified 20% Dairy Ration	John W. Eselman & Sons	23.5	20.0	4.9	4.0	48.9	7.5	8.0	6.3
1	Eselman Lancaster 20 Dairy Feed	John W. Eselman & Sons	24.1	20.0	4.1	4.0	48.0	8.2	11.0	6.5
3	Garland's 24% Ration	J. B. Garland & Son	25.1	24.0	5.1	4.5	48.0	6.9	10.0	5.6
3	Garland's Economy 20% Dairy Ration	J. B. Garland & Son	22.6	20.0	4.5	3.5	51.2	6.7	9.0	6.0
1	Royal Worrester Complete Ration	J. B. Garland & Son	19.8	20.0	4.1	3.0	50.8	8.8	10.0	6.4
5	Eventually Gold Medal Dairy Ration	General Mills, Inc.	22.6	20.0	5.3	5.0	49.0	7.5	8.5	6.6
3	Grandin's 24% Balanced Dairy Ration	D. H. Grandin Milling Co.	25.5	24.0	5.6	5.0	46.3	7.8	10.0	6.3
4	Grandin's Sweetened 24% Dairy Feed	D. H. Grandin Milling Co.	26.2	24.0	4.8	4.0	46.3	6.6	10.0	6.3
3	Grandin's 12 Twin Six 12 Dairy Feed	D. H. Grandin Milling Co.	25.7	22.0	5.2	5.0	46.7	7.6	12.0	5.7
2	Grandin's Milk Maker	D. H. Grandin Milling Co.	22.7	20.0	5.4	5.0	50.9	6.9	12.0	5.2
3	M-S (Money Saver) 20% Sweet Dairy Feed	D. H. Grandin Milling Co.	22.2	20.0	4.6	4.0	48.1	8.4	12.0	6.8
2	Grandin's Sweetened 16% Dairy Feed	D. H. Grandin Milling Co.	19.3	16.0	4.3	4.0	54.1	6.5	10.0	6.1
2	Wantmore Dairy Ration	Horvitz Grain Co.	24.0	20.0	5.0	4.0	49.0	7.8	10.0	4.7
2	Wantmore Dairy with Beet Pulp	Horvitz Grain Co.	22.5	20.0	4.2	4.0	51.8	8.1	10.0	4.0
2	Just Right Dairy Ration 24%	Jersee Co.	25.7	24.0	4.9	4.5	43.3	8.2	8.0	8.3
1	Larro—The Ready Ration for Dairy Cows	Larroe Milling Co.	21.9	20.0	4.1	4.0	50.9	9.5	12.0	4.7
2	"Monsfield" Cow-Ration	Mausfield Milling Co.	21.6	20.0	4.3	4.0	54.0	7.0	9.0	3.7
1	B B Bull Brand Dairy Ration	Maritime Milling Co., Inc.	25.9	24.0	4.3	5.0	44.4	8.2	11.0	6.2
1	Sweetened B B Bull Brand "24" Dairy Ration	Maritime Milling Co., Inc.	25.6	24.0	4.7	4.5	45.0	7.6	11.0	6.4
2	B B Hi-Fest Dairy Feed 20% Protein Sweetened	Maritime Milling Co., Inc.	22.3	20.0	4.6	4.5	46.2	10.1	12.0	6.7
2	B-B Marmico 16% Protein Dairy Feed with Molasses	Maritime Milling Co., Inc.	18.6	16.0	4.7	4.0	48.5	10.3	12.0	7.6
1	Memo 22% Sweet Dairy Feed	Mennel Milling Co.	23.1	20.0	4.1	3.5	50.2	7.8	12.0	5.2
4	New England Dairy Ration	Narragansett Milling Co.	21.0	20.0	3.9	3.0	49.0	11.3	11.5	5.7
3	Butterfat Dairy Feed with Molasses	Ontario Milling Co., Inc.	25.6	24.0	5.2	5.0	47.3	7.1	10.0	5.3

## Complete Average Analyses of Feeds Collected (Per Cent)—Continued.

## II. PREPARED FEEDS—Continued.

## (a) Protein Feeds—Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
1	<b>Dairy and Molasses Feeds (more than 15 per cent protein)—Cont.</b> Uncle John's 24% Cream Pot Ration Big Value 20% Dairy Feed with Molasses Oswego 20% Dairy Feed with Molasses Big Value 16% Dairy Feed with Molasses Milk-Maid 24% Sweetened Dairy Ration Overall 24% Dairy Ration Bet-R-Milk 20% Ration Burt's Dairy Feed Pratts B-P Dairy Feed Producer Dairy Feed Sweetened Producer Dairy Feed Purina 34% Cow Chow Purina 24% Cow Chow Protina 20% Dairy Feed Purina 20% Cow Chow Quaker 24% Protein Dairy Ration Quaker 20% Protein Dairy Ration Blue Tag Dairy Ration Wirthmore 25% Balanced Ration Sweetened Hygrade 24 Sweetened Milk Ration Hygrade 20 Sweetened Milk Ration Wirthmore Dairy Feed with Beet Pulp Sweetened Wirthmore 20 Dairy Feed Sweetened Utility Dairy Ration	Ontario Milling Co., Inc.	8.7	26.0	24.0	5.4	5.5	47.0	7.5	9.0	5.4
7		Ontario Milling Co., Inc.	10.3	23.3	20.0	5.0	4.5	48.8	7.1	10.0	5.5
5		Ontario Milling Co., Inc.	10.0	21.9	20.0	4.6	4.0	48.9	8.7	12.0	5.9
2		Ontario Milling Co., Inc.	10.1	18.9	16.0	3.5	3.5	56.2	6.8	10.0	4.5
3		Park & Pollard Co.	10.4	24.1	24.0	4.5	4.5	48.0	7.5	11.0	5.5
2		Park & Pollard Co.	9.7	25.8	24.0	5.1	4.5	46.2	7.7	9.0	5.5
3		Park & Pollard Co.	10.6	22.6	20.0	4.1	4.0	49.7	7.3	9.0	5.7
1		Postum Co., Inc.	8.8	24.7	24.0	4.5	5.0	48.6	7.9	9.0	5.5
2		Pratt Food Co., Inc.	10.4	23.8	21.0	4.6	4.0	47.8	7.5	10.0	5.9
1		H. C. Puffer Co.	9.5	22.5	20.0	4.8	3.5	51.4	6.9	10.0	4.9
1		H. C. Puffer Co.	8.4	21.6	20.0	4.3	3.5	48.1	11.8	12.5	5.8
3		Purina Mills	8.9	36.1	34.0	5.1	3.0	34.5	9.4	12.0	6.0
7		Purina Mills	9.6	26.1	24.0	4.6	3.0	44.8	9.5	12.0	5.4
3		Purina Mills	7.6	23.6	20.0	5.7	3.0	46.4	12.3	14.0	4.4
1		Purina Mills	9.9	22.3	20.0	4.2	3.0	48.8	9.9	12.0	4.9
9	Quaker Oats Co.	8.9	25.3	24.0	4.5	4.0	44.2	10.3	12.0	6.8	
4	Quaker 20% Protein Dairy Ration	Quaker Oats Co.	9.1	21.3	20.0	4.2	3.25	49.1	10.8	12.0	5.5
3	Blue Tag Dairy Ration	Ryther & Warren	9.5	22.7	20.0	4.4	4.5	50.6	8.1	10.0	4.7
3	Wirthmore 25% Balanced Ration										
1	Sweetened	St. Albans Grain Co.	9.4	27.0	25.0	4.8	4.75	45.3	7.7	8.5	5.8
1	Hygrade 24 Sweetened Milk Ration	St. Albans Grain Co.	11.0	24.1	24.0	4.3	4.0	47.6	6.5	9.0	6.5
1	Hygrade 20 Sweetened Milk Ration	St. Albans Grain Co.	9.7	22.4	20.0	4.3	4.0	50.4	7.6	8.5	5.6
2	Wirthmore Dairy Feed with Beet Pulp Sweetened	St. Albans Grain Co.	10.4	22.1	20.0	4.3	4.0	49.9	8.0	11.0	5.3
2	Wirthmore 20 Dairy Feed Sweetened	St. Albans Grain Co.	9.9	22.9	20.0	5.1	4.75	49.4	8.1	8.0	4.6
5	Utility Dairy Ration	St. Albans Grain Co.	9.8	20.4	20.0	4.0	3.5	50.7	8.8	10.5	6.3

2	Withmore 20 Dairy Feed	St. Albans Grain Co.	.	.	.	.	.	.	.	10.2	21.8	20.0	5.4	5.0	47.9	7.5	8.5	7.2
2	Hygrade 16 Sweetened Milk Ration	St. Albans Grain Co.	.	.	.	.	.	.	.	10.4	18.9	16.0	4.2	3.5	53.4	7.5	8.5	5.6
1	Withmore 16 Dairy Ration Sweetened	St. Albans Grain Co.	.	.	.	.	.	.	.	10.5	19.9	16.0	4.7	4.0	53.5	6.5	8.0	4.9
1	The Ideal Dairy Ration	C. H. Symmes	.	.	.	.	.	.	.	10.8	22.9	20.0	5.3	3.5	49.2	7.3	8.5	4.5
1	Syracuse Dairy Feed	Syracuse Milling Co.	.	.	.	.	.	.	.	8.9	25.1	24.0	5.6	4.5	46.6	9.0	12.0	4.8
2	Red Brand Ti-O-Ga Dairy Feed	Tioga-Empire Feed Mills, Inc.	.	.	.	.	.	.	.	9.5	26.3	24.0	5.0	4.5	44.0	7.3	10.0	7.9
2	Es-Gee Dairy Feed	Tioga-Empire Feed Mills, Inc.	.	.	.	.	.	.	.	8.6	29.9	20.0	5.4	3.5	49.4	7.8	10.0	5.9
1	United Farmers Milk Pop.	United Co-Operative Farmers, Inc.	.	.	.	.	.	.	.	10.0	27.4	24.0	4.6	4.5	46.3	6.3	8.0	5.4
2	United Farmers Milkpop.	United Co-Operative Farmers, Inc.	.	.	.	.	.	.	.	10.0	22.7	20.0	5.0	4.0	50.5	6.9	8.0	5.0
2	"Made Right" Molasses Dairy Feed	C. P. Washburn Co.	.	.	.	.	.	.	.	8.6	22.0	22.0	4.9	5.0	50.6	9.4	10.0	4.5
2	"Made Right" Molasses Dairy Feed	C. P. Washburn Co.	.	.	.	.	.	.	.	9.9	21.2	20.0	4.7	4.0	50.9	8.5	8.0	4.8
2	Blue Seal Improved Balanced Ration	H. K. Webster Co.	.	.	.	.	.	.	.	9.1	26.1	24.0	6.3	5.0	46.9	6.9	8.5	4.7
2	Blue Seal "21" Dairy Ration	H. K. Webster Co.	.	.	.	.	.	.	.	9.0	23.2	21.0	6.3	5.0	48.8	7.0	8.5	5.1
2	Blue Seal "20" Dairy Ration	H. K. Webster Co.	.	.	.	.	.	.	.	9.8	21.1	20.0	4.7	4.5	53.0	6.6	9.0	4.6
3	Blue Seal "Lo-Cost" Dairy Ration	H. K. Webster Co.	.	.	.	.	.	.	.	9.5	20.8	20.0	6.8	5.5	51.1	7.2	8.5	4.6
1	Super Pure Sweetfeed Dairy Ration	West-Nesbitt, Inc.	.	.	.	.	.	.	.	10.8	25.8	24.0	4.4	4.5	45.4	7.0	10.0	6.6
1	All Pure 20% Milk Ration	West-Nesbitt, Inc.	.	.	.	.	.	.	.	10.4	22.9	20.0	4.6	4.5	48.0	7.0	10.0	7.1
2	Pure Feed Dairy Ration	West-Nesbitt, Inc.	.	.	.	.	.	.	.	9.1	23.5	20.0	4.3	4.0	49.7	8.3	10.0	5.1
2	Pure Sweetfeed Dairy Ration	West-Nesbitt, Inc.	.	.	.	.	.	.	.	12.6	24.3	20.0	3.7	4.0	46.8	6.7	10.0	5.9
1	Uniform Sweet Dairy Ration	West-Nesbitt, Inc.	.	.	.	.	.	.	.	9.6	18.2	16.0	3.4	3.0	50.7	11.4	14.0	6.7
2	Williams' Balanced Ration	Estate of M. G. Williams	.	.	.	.	.	.	.	9.8	22.7	20.0	4.9	4.0	50.7	6.9	12.0	5.0
2	Bliss Dairy Ration	Stanley Wood Grain Co.	.	.	.	.	.	.	.	8.7	24.0	22.0	4.8	5.0	51.1	6.4	10.0	5.0
2	Woods Dairy Ration	Stanley Wood Grain Co.	.	.	.	.	.	.	.	9.1	22.4	20.0	4.9	5.0	48.6	9.2	10.0	5.8
<b>Hog Feeds.</b>																		
2	More-Value Hog Ration	Associated Farmers' Exchanges, Inc.	.	.	.	.	.	.	.	9.1	22.8	22.0	5.4	4.0	48.1	6.2	8.5	8.4
1	Beacon Hog Feed	Beacon Milling Co., Inc.	.	.	.	.	.	.	.	8.2	20.8	18.0	5.7	5.0	51.4	6.3	7.0	7.6
3	Eastern States Hog Meal	Eastern States Farmers' Exchange	.	.	.	.	.	.	.	9.8	16.2	15.0	4.8	4.0	58.9	3.5	5.5	6.8
3	Larro Hog Feed	Larroe Milling Co.	.	.	.	.	.	.	.	9.0	19.4	18.0	6.2	5.0	50.9	8.2	10.0	6.4
1	Quaker 18% Protein Pig-N-Hog Meal	Quaker Oats Co.	.	.	.	.	.	.	.	8.4	21.9	18.0	5.2	3.5	48.8	9.0	10.0	7.7
1	Withmore Pig and Hog-A Growing and Fattening Feed	St. Albans Grain Co.	.	.	.	.	.	.	.	11.5	19.0	17.0	5.3	4.0	52.3	6.0	9.0	5.9
<b>Calf Meals.</b>																		
2	Wayne Calf Meal	Allied Mills, Inc.	.	.	.	.	.	.	.	9.3	25.3	24.0	4.7	4.0	49.4	6.4	7.0	4.9
1	Blatchford's Calf Meal	Blatchford Calf Meal Co.	.	.	.	.	.	.	.	9.5	26.0	24.0	4.7	5.0	48.8	5.0	6.75	6.0
1	Delaware Calf Food	Delaware Mills, Inc.	.	.	.	.	.	.	.	9.4	24.0	24.0	3.7	5.0	55.3	3.4	7.0	4.2
1	Elmore "Three Point" Calf Meal	Elmore Milling Co., Inc.	.	.	.	.	.	.	.	11.0	25.2	24.0	3.1	4.0	54.2	2.3	4.0	4.2
1	Eschelman Red Rose Calf Starter	John W. Eschelman & Sons	.	.	.	.	.	.	.	9.7	34.8	18.0	5.1	3.0	53.8	3.5	5.0	3.1
4	Purina Calf Chow	Purina Mills	.	.	.	.	.	.	.	9.3	30.3	27.0	4.6	3.2	48.9	3.1	4.5	3.8
1	Withmore Calf Meal	St. Albans Grain Co.	.	.	.	.	.	.	.	8.9	26.4	24.0	6.0	5.5	52.8	2.3	4.0	3.6
1	Ti-O-Ga Calf Food	Tioga-Empire Feed Mills, Inc.	.	.	.	.	.	.	.	10.5	25.2	21.0	5.2	4.0	49.2	3.3	7.0	6.6

Complete Average Analyses of Feeds Collected (Per Cent)—Continued.  
 II. PREPARED FEEDS—Continued.  
 (b) *Starchy Feeds.*

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
<b>Fitting Rations.</b>											
2	Amco 12% Fitting Rations . . .	Allied Mills, Inc. . . . .	10.6	13.7	12.0	3.5	3.0	61.4	6.1	9.0	4.7
8	Munc-May-Ker Fitting Ration . .	Associated Farmers' Exchanges, Inc. .	9.7	15.1	12.0	4.2	3.5	58.9	7.1	7.0	5.0
4	Eastern States Fitting Ration . .	Eastern States Farmers' Exchange . .	10.6	15.2	12.0	4.3	3.5	59.4	5.9	7.0	4.6
2	Eastern States Highland 12 . . .	Park & Pollard Co. . . . .	9.6	14.2	12.0	3.7	3.5	57.5	9.8	11.5	5.2
1	Park & Pollard Fitting Ration . .	Purina Mills . . . . .	11.9	15.3	12.0	4.3	3.5	57.8	6.2	7.0	4.5
2	Purina Fitting Chow . . . . .	Ryther & Warren . . . . .	12.4	16.9	13.5	4.3	2.6	52.3	8.9	12.0	5.2
1	Minot Fitting Ration . . . . .	St. Albans Grain Co. . . . .	9.6	15.0	13.0	4.6	4.0	57.0	8.5	12.0	5.3
1	Utility 60 Pasture Ration . . . .	St. Albans Grain Co. . . . .	9.7	14.9	14.0	3.4	3.0	54.0	13.1	13.0	4.9
1	Wilmington 14 Fitting Ration . .	St. Albans Grain Co. . . . .	9.5	16.5	14.0	4.3	4.0	57.1	7.8	7.0	4.8
3	Hygrade Fitting Ration or Stock Feed . . . . .	St. Albans Grain Co. . . . .	10.4	11.8	10.0	3.5	3.25	57.8	10.3	12.0	6.2
2	United Farmers Fitting Ration . .	United Co-Operative Farmers, Inc. . .	10.6	14.5	12.0	4.7	3.5	57.7	6.7	7.0	5.8
<b>Stock and Horse Feeds (less than 10 per cent fiber).</b>											
2	Pennant Brand Stock Feed . . . .	E. W. Bailey & Co. . . . .	8.7	10.8	9.5	6.3	4.0	61.2	9.3	9.5	3.7
1	Beacon Special Horse Feed . . . .	Beacon Milling Co., Inc. . . . .	10.8	13.0	10.5	3.0	3.0	64.6	5.9	6.0	2.7
2	Cowry's Stock Feed . . . . .	Nicolas Courcy . . . . .	10.3	11.9	10.0	4.1	3.0	59.6	9.7	12.0	4.4
3	Cowco's Stock Feed . . . . .	E. A. Cowco Co. . . . .	8.5	11.7	9.0	5.6	4.0	61.4	8.3	11.0	4.5
1	King Stock Feed . . . . .	Cutler Co. . . . .	8.4	10.8	9.0	6.2	4.0	62.2	9.1	10.0	3.3
1	Delaware Stock Feed . . . . .	Delaware Mills, Inc. . . . .	10.0	10.0	9.0	4.5	3.0	62.5	9.8	12.0	3.2
1	Grandin's Stock Food . . . . .	D. H. Grandin Milling Co. . . . .	7.8	10.8	8.5	5.7	4.0	62.8	9.4	12.0	3.4
2	Uncle John's Stock Feed . . . . .	Ontario Milling Co., Inc. . . . .	9.3	12.2	9.5	4.1	3.0	60.5	9.4	12.0	4.5
1	Pratt's Sugared Stock Feed . . . .	Pratt Food Co., Inc. . . . .	10.6	12.6	10.0	3.2	3.0	59.0	9.0	12.0	5.6
5	Wirthmore Stock Feed . . . . .	St. Albans Grain Co. . . . .	9.2	10.8	9.0	5.4	4.0	62.1	8.9	9.5	3.6
1	Syracuse Stock Feed . . . . .	Syracuse Milling Co. . . . .	9.9	9.9	9.0	4.1	3.0	63.5	9.3	12.0	3.3
2	"Made Right" White Stock Feed .	C. P. Washburn Co. . . . .	9.5	11.3	8.0	5.5	3.5	62.9	7.6	10.0	3.2
2	Blue Seal Stock Feed . . . . .	H. K. Webster Co. . . . .	8.9	11.5	9.0	3.4	3.5	62.7	9.5	11.0	4.0
1	Williams' Stock Feed . . . . .	Estate of M. G. Williams . . . . .	10.8	11.6	11.0	4.0	4.0	60.7	9.3	12.0	3.6
1	Woods Stock Feed . . . . .	Stanley Wood Grain Co. . . . .	9.6	12.0	8.0	4.7	3.5	61.4	7.7	12.0	4.6

Stock and Horse Feeds (10 to 12 per cent fiber).

1	Coweco Stock Feed	E. A. Cowee Co.	8.6	8.6	9.0	3.9	4.0	61.8	11.9	11.0	5.2
3	Quality Stock Feed	J. Cushing Co.	9.0	11.2	9.0	4.2	3.0	60.8	11.1	12.0	3.7
1	Delaware Stock Feed	Delaware Mills, Inc.	8.6	11.3	9.0	3.8	3.0	59.4	12.0	12.0	4.9
1	Diel's Stock Feed	F. Diel & Son, Inc.	8.0	14.2	8.0	4.7	2.0	56.9	11.8	18.0	4.4
1	Eastern Stock Feed	Eastern Grain Co.	8.5	10.2	9.0	6.3	4.0	61.1	10.4	9.0	3.5
1	Elmore Stock Feed	Elmore Milling Co., Inc.	8.7	10.4	10.0	5.1	3.0	61.1	10.7	12.0	4.0
3	White Stock Feed	J. B. Garland & Son	9.4	9.2	8.0	4.5	3.0	60.6	11.8	16.0	4.5
2	Red Tag A Chop	J. B. Garland & Son	8.5	10.1	7.0	8.5	4.0	59.8	10.6	14.0	7.0
3	Grandin's Stock Feed	D. H. Grandin Milling Co.	8.6	12.3	8.5	5.8	4.0	60.4	10.7	12.0	3.8
1	Uncle John's Stock Feed	Ontario Milling Co., Inc.	9.6	12.3	9.5	2.8	3.0	57.9	11.3	12.0	6.1
1	Protons Stock Feed	Purina Mills	9.4	11.3	9.0	3.3	2.3	61.4	10.5	12.0	4.1
3	Quaker Sugared Schumacher Feed	Quaker Oats Co.	9.0	11.2	10.0	3.6	3.0	58.7	11.5	12.0	6.0
1	Wirthmore Stock Feed	St. Albans Grain Co.	9.6	10.2	9.0	4.8	4.0	61.6	10.4	9.5	3.4
1	Blue Seal Stock Feed	H. K. Webster Co.	8.3	10.8	9.0	5.0	3.5	61.0	10.8	11.0	4.1
1	Williams' Stock Feed	Estate of M. G. Williams	9.1	12.3	11.0	3.9	4.0	60.3	10.4	12.0	4.0
1	Woods Stock Feed	Stanley Wood Grain Co.	8.9	10.5	8.0	5.4	3.5	59.1	11.1	12.0	5.0

Stock and Horse Feeds (more than 12 per cent fiber).

2	Academy Stock Feed	Academy Farms Milling Co.	9.0	11.7	9.0	3.8	3.5	57.5	13.5	12.0	4.5
1	Quality Stock Feed	J. Cushing Co.	8.9	10.9	9.0	2.8	3.0	61.7	12.2	12.0	3.5
1	J. C. Stock Feed	J. Cushing Co.	9.9	9.1	8.0	4.2	4.0	60.5	12.1	15.0	4.2
2	Delaware Stock Feed	Delaware Mills, Inc.	9.3	11.9	9.0	3.7	3.0	57.6	12.8	12.0	4.7
3	Garland's HiCarbo Ration	J. B. Garland & Son	10.5	7.8	7.0	2.5	2.0	57.0	16.1	17.0	6.1
3	Red Tag A Chop	J. B. Garland & Son	9.4	10.3	7.0	4.1	3.0	58.6	12.0	14.0	5.6
1	Stratton & Co's "24" Stock Feed	Stratton & Co.	10.1	8.9	7.5	4.7	2.83	60.7	12.4	14.43	3.2

Molasses Feeds (less than 15 per cent protein).

3	June Pasture	Allied Mills, Inc.	15.1	11.9	10.0	1.2	0.5	48.4	16.7	21.0	6.7
2	Wayne Supreme Horse Feed	Allied Mills, Inc.	11.6	12.6	9.5	4.1	3.5	61.8	6.9	8.0	3.0
3	Wonder Horse & Mule Feed	Academy Farms Milling Co.	12.8	10.9	9.0	3.6	3.0	63.7	6.2	10.0	2.8
1	Wonder Sweet Lassies Feed	Academy Farms Milling Co.	14.8	11.1	9.0	1.6	1.0	43.9	19.0	25.0	9.0
9	Munc-May-Ker Horse Feed	Associated Farmers' Exchanges, Inc.	12.5	12.8	10.5	3.6	3.5	62.2	5.4	6.5	3.5
1	Beacon Horse Feed	Beacon Milling Co., Inc.	11.9	12.2	9.0	2.7	2.5	65.1	5.7	11.0	2.4
2	Quality Horse Feed	J. Cushing Co.	12.3	11.6	8.0	4.0	2.0	62.4	6.9	9.0	2.8
1	Delaware 85% Horse Feed	Delaware Mills, Inc.	12.8	12.1	9.0	2.9	3.0	66.4	3.5	10.0	2.4
1	Garbriell's Horse Feed	Dietrich & Gambrell, Inc.	3.9	12.1	10.0	3.5	3.5	72.3	5.4	12.0	4.8
5	Eastern States Horse and Calf Ration	Eastern States Farmers' Exchange	12.4	13.2	10.5	3.8	3.5	60.5	5.8	7.0	4.3
1	Eastern States Succulence	Eastern States Farmers' Exchange	14.6	12.5	10.0	2.0	1.5	54.4	12.3	14.0	4.2
1	Elmore's Sugared Feedall	Elmore Milling Co., Inc.	7.2	13.8	10.0	3.1	3.0	51.3	17.1	12.0	7.5
2	Elmore Horse Feed with Molasses	Elmore Milling Co., Inc.	14.1	11.4	9.0	3.4	2.5	61.3	5.9	11.0	3.9
2	Eshelman S-O-S	John W. Eshelman & Sons	10.2	13.5	11.0	2.1	2.0	52.8	14.2	15.0	7.2
2	Eshelman Red Rose 85 Horse Feed	John W. Eshelman & Sons	12.4	12.2	9.0	4.1	3.0	62.6	5.9	10.0	2.8

## Complete Average Analyses of Feeds Collected (Per Cent)—Continued.

## II. PREPARED FEEDS—Concluded.

(b) *Starchy Feeds*—Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Molasses Feeds (less than 15 per cent protein)—Concluded.</b>										
1	Grandin's Sweetened Horse Feed	D. H. Grandin Milling Co.	11.8	11.7	9.5	3.6	3.5	64.5	5.8	11.0	2.6
1	B-B Putty Horse Feed with Alfalfa and Molasses	Maritime Milling Co., Inc.	13.1	10.8	6.5	2.9	1.5	58.4	11.2	12.0	3.6
1	Memo 85% Grain Horse Feed (with Bran)	Mennel Milling Co.	12.9	11.3	9.0	3.7	3.0	64.3	4.9	12.0	2.9
1	Narragansett Indian Horse Feed	Narragansett Milling Co.	11.7	11.5	9.0	3.4	3.0	61.3	9.1	10.0	3.0
2	Domino Vin-O-Lene Horse Feed	Nowak Milling Corp.	10.5	11.1	9.5	3.5	3.0	67.1	5.5	9.0	2.3
2	Onto Horse Feed with Molasses	Ontario Milling Co., Inc.	11.5	10.0	12.5	4.1	3.2	60.2	8.0	10.0	3.7
3	Park & Pollard Horse Feed	Park & Pollard Co.	12.0	13.0	10.0	4.0	3.5	60.3	7.5	9.0	3.2
1	Purina Lamb Chow	Purina Mills	13.2	16.3	14.0	4.1	3.0	53.5	7.2	12.0	5.7
5	Purina Omulene Chow	Purina Mills	13.0	12.3	10.0	4.0	3.2	61.6	6.2	9.0	2.9
2	Purina Bulky Las Chow (Buffalo Mill)	Purina Mills	12.0	13.3	9.0	2.8	1.3	54.0	12.2	15.0	5.7
4	Provena Sweet Roughage Feed (Buffalo Mill)	Purina Mills	9.9	10.8	6.0	2.9	1.0	51.7	18.9	30.0	5.8
2	Quaker Thorobred Horse Feed	Quaker Oats Co.	11.2	11.7	10.5	3.9	3.5	64.0	5.8	9.0	3.4
5	Wirthmore Horse Feed	St. Albans Grain Co.	12.9	11.0	9.8	3.6	3.25	64.0	6.0	9.0	2.5
1	Wirthmore Fodder Greens	St. Albans Grain Co.	11.9	11.9	9.0	2.6	1.25	53.7	15.8	19.0	4.1
2	Neverfail Horse Feed	Tioga-Empire Feed Mills, Inc.	10.8	12.8	10.0	3.9	3.5	63.2	6.4	10.0	2.9
1	United Farmers Horse Feed	United Co-Operative Farmers, Inc.	14.6	12.6	10.5	3.4	3.5	62.1	4.8	6.5	2.5
2	Blue Seal Horse Feed	H. K. Webster Co.	11.6	11.4	10.5	4.2	3.5	65.1	4.8	8.0	2.9
	<b>Miscellaneous Mixtures.</b>										
2	Ground Oats & Out Feed or Banner Feed	F. Diehl & Son, Inc.	6.8	13.4	6.0	5.9	2.0	55.5	14.0	30.0	4.4
3	Banner Feed	Quaker Oats Co.	5.7	14.2	13.0	6.8	4.5	51.8	16.4	18.0	5.1
1	Fleischmann's Dried Grains	Standard Brands, Inc.	6.3	22.6	18.0	9.0	6.0	46.3	13.7	18.0	2.1
2	"Made Right" Feed	C. P. Washburn Co.	11.1	18.0	14.0	4.3	4.0	55.5	6.6	10.0	4.5



### III. POULTRY FEEDS.

Alfalfa Meal.										
2	Alfalfa Meal	7.7	15.4	14.0	2.0	1.75	39.5	29.0	33.0	6.4
1	Choice Fine Ground Alfalfa Meal	8.3	15.3	14.0	1.9	2.0	40.3	28.7	30.0	5.5
1	Alfalfa Meal	10.3	15.1	13.0	1.7	2.0	41.4	25.3	35.0	6.5
5	Alfalfa Leaf Meal (Leafalfa Brand)	7.0	21.4	20.0	2.5	1.5	41.8	15.4	18.0	11.9
1	Fernando Ideal Greens (Sun Cured)	7.0	21.5	20.0	2.8	3.0	37.7	20.7	18.0	10.3
1	Fernando Alfalfa Stock Meal	7.1	20.2	10.0	1.3	1.5	35.8	39.5	39.0	6.1
1	Dehydrated Alfalfa Meal	6.7	23.6	17.0	4.0	3.0	42.7	15.7	28.5	7.3
1	Velvet Meal	8.3	18.7	17.0	2.3	1.5	42.4	19.6	23.0	8.7
3	Alfalfa Meal	8.0	13.4	13.0	1.7	1.5	41.3	30.4	36.0	3.2
1	Fine Ground Poultry Alfalfa Meal	7.2	19.8	17.0	2.5	1.6	42.3	29.9	25.0	7.3
Feeding Oatmeal.										
3	Alpine Feeding Oatmeal	9.0	18.3	14.0	7.8	5.0	57.0	4.4	3.9	3.5
1	Gold Medal Fine Ground Feeding Oatmeal	7.5	18.4	15.5	6.4	6.0	63.2	1.5	3.0	3.0
1	Feeding Oatmeal	7.8	16.5	16.0	8.0	6.0	64.4	1.6	4.0	1.7
Chick Starting and Growing Feeds.										
3	Wayne All Mash	9.9	17.0	16.0	5.9	1.0	55.7	4.8	6.0	6.7
1	Growing Mash	10.1	19.7	18.0	6.5	4.5	50.6	4.7	6.0	8.4
1	Ames Complete Starting Ration	9.7	18.5	17.5	3.3	4.0	57.0	3.8	5.0	3.7
2	Wonder Turkey Growing Mash	9.8	16.4	16.0	4.7	4.0	55.6	5.9	7.0	7.6
4	Arceady Beshet Growing Mash	9.2	16.6	16.0	5.3	4.0	54.7	6.6	10.0	7.6
6	Mune-May-Ker Starting and Growing Mash	9.1	19.3	16.5	5.3	4.0	53.4	4.8	6.0	8.1
3	More-Value Growing Mash	9.1	16.2	14.0	5.5	3.5	56.8	6.3	8.0	6.1
1	Beacon Duck Starter	8.6	19.2	17.0	4.7	4.5	56.9	4.9	6.0	5.7
1	Beacon Senior Duck Grower	8.8	19.8	17.0	5.1	4.5	56.2	4.1	7.0	6.0
3	Beacon Growing Mash	9.0	18.7	17.0	3.2	4.0	53.4	5.2	7.0	8.5
3	Beacon Special Coccidiosis Mash	7.9	19.3	17.0	2.9	1.0	60.4	2.6	5.0	6.9
2	Beacon Complete Starting Ration	9.7	19.0	16.5	4.7	4.0	55.9	6.0	6.0	6.7
4	Beacon's Cayuga Growing Mash	9.5	17.8	16.0	5.3	4.0	53.4	6.2	7.0	7.8
1	Chariot Starter & Grower	9.8	17.4	16.0	5.1	4.0	54.6	5.2	7.0	7.9
1	Beacon Turkey Growing Feed	7.2	18.3	16.0	5.6	4.0	53.0	6.1	7.0	9.8
1	Borden Grain Co.	9.5	20.2	17.0	5.9	4.0	51.1	4.6	6.0	8.7
1	Climax Growing Feed	9.6	17.0	16.0	5.3	3.0	55.0	5.6	8.0	7.5
2	Courcy's Growing Feed	9.7	18.4	17.0	5.3	4.0	55.0	4.7	5.0	6.9
1	Eastern Starting Feed	11.0	19.3	17.0	5.3	5.0	54.3	4.2	5.0	5.9
1	Coweco Starting Mash	9.7	18.4	17.0	5.7	4.5	52.0	5.1	6.0	9.1
1	Coweco Growing Mash	8.0	17.7	14.0	6.0	4.5	56.2	4.3	6.0	7.8

Complete Average Analyses of Feeds Collected (Per Cent)—Continued.  
 III. POULTRY FEEDS—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.		Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Chick Starting and Growing Feeds—Continued.</b>											
1	Crystal Growing Mash (with Dried Milk)	Curley Brothers	10.1	16.0	18.0	16.0	5.1	5.0	55.1	5.3	5.0	6.4
1	Delaware Growing Mash (with Dried Skim Milk)	Delaware Mills, Inc.	8.4	18.2	17.0	17.0	5.7	5.0	54.1	5.3	6.0	8.3
1	Delaware All Mash Chick Food	Delaware Mills, Inc.	11.0	17.5	14.0	14.0	6.1	4.0	53.8	4.9	6.0	6.7
1	Eastern All-Purpose Chick and Broiler Ration	Eastern Grain Co.	9.3	19.2	17.5	17.5	4.8	4.0	56.3	4.4	5.5	6.0
1	Eastern States Turkey-Start	Eastern States Farmers' Exchange	8.4	24.3	24.0	24.0	6.2	4.5	47.9	4.0	5.0	9.2
1	Eastern States Developer with Cod Liver Oil	Eastern States Farmers' Exchange	9.3	20.0	18.5	18.5	5.5	4.0	53.1	6.1	6.0	6.0
1	Eastern States Starting & Growing Mash with Cod Liver Oil	Eastern States Farmers' Exchange	9.2	17.6	16.5	16.5	6.1	4.0	55.0	5.0	6.0	7.1
3	Elmore Growing Mash	Elmore Milling Co., Inc.	9.2	19.9	17.0	17.0	5.9	4.0	51.5	5.9	8.0	7.6
1	Elmore Chix-saver	Elmore Milling Co., Inc.	9.7	20.1	16.5	16.5	7.2	4.0	53.3	4.4	8.0	5.3
2	Fountain's Buttermilk Starting Feed	Fred A. Fountain	10.1	20.9	17.0	17.0	5.0	4.0	54.7	3.7	6.0	5.6
2	Fountain's Buttermilk's Growing Feed	Fred A. Fountain	10.7	19.1	16.0	16.0	4.8	4.5	55.4	4.4	7.0	5.6
1	Garland's Fancy Chick Mash	J. B. Garland & Son	9.1	20.5	17.0	17.0	5.8	5.0	51.9	4.5	8.0	8.2
1	Eventually Gold Medal Growing Mash with Dried Buttermilk	General Mills, Inc.	8.6	20.0	18.0	18.0	5.7	4.0	53.0	4.8	6.0	7.9
1	Grandin's Complete Starting Ration with Buttermilk—Cod Liver Oil	D. H. Grandin Milling Co.	10.2	18.7	16.0	16.0	5.1	4.0	55.4	4.5	6.0	6.1
1	Grandin's Growing Mash with Buttermilk	D. H. Grandin Milling Co.	8.8	17.8	15.0	15.0	5.1	4.0	53.1	5.8	8.0	9.4
1	Grandin's Growing Mash with Buttermilk's—Cod Liver Oil	D. H. Grandin Milling Co.	7.9	17.0	15.0	15.0	5.4	4.0	55.2	6.0	8.0	8.5
2	Grandin's Baby Chick Starter with Buttermilk—Cod Liver Oil	D. H. Grandin Milling Co.	9.8	16.0	14.0	14.0	5.7	4.0	61.2	3.3	5.0	4.0
8	Just Right Growing Mash	Jersey Co.	8.9	17.8	16.0	16.0	5.0	4.0	55.5	6.4	6.0	6.4
1	Just Right Chick Starter	Jersey Co.	10.4	16.5	15.0	15.0	5.1	4.0	56.2	6.1	6.0	5.4
1	Larroe Chick Starter	Larroe Milling Co.	9.0	18.4	16.5	16.5	5.2	4.5	57.0	4.5	5.0	5.9
2	Larroe Growing Mash	Larroe Milling Co.	8.8	18.0	16.0	16.0	5.5	4.5	56.9	5.7	6.5	6.6
2	"Mansfield" Chick-Growing-Feed	Mansfield Milling Co.	10.0	21.2	17.0	17.0	5.3	4.0	50.9	6.7	8.0	5.9



**Complete Average Analyses of Feeds Collected (Per Cent)—Continued.**  
**III. POULTRY FEEDS—Continued.**

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Laying Mash—Continued.</b>										
1	Bidwell Dry-Mash	Black Rock Milling Corp.	9.4	21.0	18.0	3.3	3.0	54.6	5.6	8.0	6.1
1	Borden's Laying Mash	Borden Grain Co.	9.2	20.0	19.0	6.1	4.5	51.0	5.8	7.0	7.9
1	Brown's Laying Mash	Geo. B. Brown	9.6	19.9	18.5	4.7	6.0	48.6	5.2	6.0	12.0
1	Cimax Laying Mash	Butman Grain & Feed Co.	10.5	19.0	18.0	5.5	4.0	50.3	4.9	7.0	9.0
2	Chapin Kernels Lay-All	Chapin & Co.	8.3	19.0	16.0	4.4	3.5	59.3	3.6	5.5	5.4
1	Fortune Egg Mash	Coles Co.	8.7	21.3	17.0	5.8	3.5	48.3	5.6	9.0	10.3
2	Community Milk Laying Mash	Community Feed Stores, Inc.	8.5	20.2	20.0	5.6	4.0	50.9	6.5	8.0	8.3
2	Courcy's Eastern Laying Mash	Nicolas Courcy	9.9	19.9	17.0	4.8	4.0	52.4	4.8	6.0	8.2
2	The Perfect Dry Mash	Cover & Palm Co.	9.0	20.2	15.0	5.5	4.0	50.3	7.1	10.0	7.9
1	Coweco Laying Mash	E. A. Cowee Co.	8.7	22.0	20.0	4.9	4.0	50.8	4.6	7.5	9.8
1	Crystal Egg Mash (with Dried Milk)	Curley Brothers	9.4	20.1	18.0	4.9	4.0	50.8	5.8	6.0	9.0
1	Quality Laying Mash	J. Cushing Co.	7.6	22.2	20.0	5.7	5.0	48.3	6.1	7.0	10.1
3	Big C Mash	J. Cushing Co.	9.2	22.5	19.0	5.6	4.5	48.6	5.2	8.0	8.9
1	Diamond A Mash	J. Cushing Co.	9.3	19.9	18.0	5.7	6.0	52.2	7.3	9.0	5.6
4	Indian Laying Mash (with Dried Skim Milk)										
2	Diehl's Dry Mash	Delaware Mills, Inc.	9.7	19.7	18.0	6.1	5.0	50.6	5.5	7.0	8.4
1	Gambrell's Laying Mash	F. Diehl & Son, Inc.	8.3	25.8	16.0	4.6	3.0	48.5	9.1	12.0	6.7
1	Excel Mash	Dietrich & Gambrell, Inc.	10.1	23.4	20.0	5.3	5.0	46.0	5.7	7.0	9.5
1	Eastern Complete Ration for Layers	J. L. Dummell & Son	9.9	22.2	19.0	5.1	5.0	50.2	4.7	6.0	7.9
6	Eastern States Milk Egg Mash with Cod Liver Oil	Eastern Grain Co.	9.8	17.5	15.0	5.0	4.0	57.7	4.2	5.0	5.8
2	The Ellis Poultry Mash	Eastern States Farmers' Exchange	9.9	18.5	17.0	5.7	4.0	53.3	5.2	6.5	7.4
3	Elmore Egg Mash	Michael W. Ellis	9.4	21.8	20.0	4.8	4.0	47.9	5.2	8.0	10.9
2	Elmore Eggmaker	Elmore Milling Co., Inc.	9.4	20.5	18.0	6.3	4.0	50.6	6.2	8.0	7.0
2	Eselman Red Rose Laying Mash	Elmore Milling Co., Inc.	10.2	18.9	17.0	6.8	4.5	52.9	4.7	8.0	6.5
1	Flory's Egg Mash with Cod Liver Oil	John W. Eselman & Sons	9.8	22.0	20.0	6.1	5.0	48.8	5.9	7.0	7.4
2	Fountain's Buttermilk Laying Mash	Flory Milling Co., Inc.	9.1	21.8	20.0	5.1	4.5	51.9	5.5	6.0	6.6
1	O. K. Poultry Mash	Fred A. Fountain	10.0	20.6	17.0	5.2	4.5	51.9	4.5	7.0	7.8
3	Garland's Poultry Mash	E. & A. M. Fullerton, Inc.	10.6	19.0	15.0	6.1	5.0	50.9	7.1	7.0	6.3
1	Eventually Gold Medal Egg Mash	J. B. Garland & Son	8.4	23.6	20.0	5.7	4.0	45.2	4.7	8.0	12.6
1	"Neponset Poultry Mash"	General Mills, Inc.	8.6	22.3	20.0	6.0	5.5	50.0	6.1	7.0	7.2
		W. K. Gilmore & Sons, Inc.		23.5	20.0	6.2	3.0	45.6	6.7	10.0	9.4

	Grandin's Laying Mash with Buttermilk	D. H. Grandin Milling Co.	8.8	23.5	20.0	5.5	4.0	46.8	5.6	8.0	9.8
2	Grandin's Laying Mash with Buttermilk	D. H. Grandin Milling Co.	8.8	23.5	20.0	5.5	4.0	46.8	5.6	8.0	9.8
4	Grandin's Laying Mash with Buttermilk—Cod Liver Oil	D. H. Grandin Milling Co.	9.3	22.4	20.0	5.4	4.0	48.1	5.4	8.0	9.4
1	Daily Egg Mash Feed	Great Atlantic & Pacific Tea Co.	7.7	22.1	20.0	6.2	4.5	49.1	5.4	7.0	9.5
1	Morning Glory Egg Mash with Dried Buttermilk	Hales & Hunter Co.	8.9	19.4	20.0	5.6	4.5	51.6	5.7	8.0	8.8
1	Red Comb Egg Mash with Dried Buttermilk	Hales & Hunter Co.	9.5	19.2	18.0	5.9	4.0	51.9	6.2	7.0	7.3
2	Make-M-Lay Laying Mash	Horvitz Grain Co.	9.4	21.4	20.0	5.4	5.0	48.9	6.6	6.0	8.3
1	Open Formula Mash	Horvitz Grain Co.	10.5	18.4	17.0	4.5	4.5	53.7	4.4	7.0	8.5
1	Just Right Egg Mash	Jersee Co.	8.8	22.3	20.0	5.7	4.0	46.3	8.1	8.0	8.8
8	Larroe Egg Mash	Larroe Milling Co.	8.7	19.0	19.0	5.4	5.0	50.5	5.3	7.5	9.2
4	"Mansfield" Dry-Poultry-Mash	Mansfield Milling Co.	10.5	23.8	22.0	5.7	5.0	47.8	5.0	7.0	7.2
4	Narragansett Indian Egg Mash	Narragansett Milling Co.	9.1	21.3	20.0	5.6	5.0	46.2	5.3	7.0	12.5
2	Aunt Mary's Laying Mash with Dried Buttermilk	Ontario Milling Co., Inc.	9.8	21.0	19.0	5.3	4.0	49.0	6.0	8.5	8.9
3	Oswego Laying Mash with Dried Buttermilk	Ontario Milling Co., Inc.	9.5	19.4	18.0	5.3	4.0	52.4	6.0	8.5	7.4
4	Lay or Bust Dry-Mash	Park & Pollard Co.	10.5	19.7	18.0	5.1	3.0	52.5	5.0	7.0	7.2
1	Pratt's Laying Mash with Buttermilk	Pratt Food Co., Inc.	8.6	23.3	20.0	5.3	4.5	48.0	5.8	6.75	9.0
1	Pratt's Cak-Cak Egg Mash	Pratt Food Co., Inc.	10.1	21.4	18.0	5.5	4.0	50.1	5.1	8.0	7.8
1	Egg-Em-On Laying Mash	H. C. Puffer Co.	9.4	23.0	20.0	4.6	4.0	47.8	8.6	9.0	8.6
1	Purina Breeder Egg Chowder	Purina Mills	10.0	21.3	19.0	5.0	3.5	49.6	6.6	8.0	7.5
6	Purina Egg Chowder containing Mineral	Purina Mills	8.6	21.2	19.0	5.0	3.5	50.7	6.7	8.0	7.8
5	Purina Lay Chow containing Mineral	Purina Mills	10.0	18.7	17.0	4.5	2.5	54.1	6.2	8.0	6.5
3	Quaker Pul-O-Pop Egg Mash	Quaker Oats Co.	8.8	21.7	20.0	5.7	4.0	50.4	6.0	8.0	7.4
1	Minot Poultry Mash	Ryther & Warren	8.2	21.2	18.0	6.0	4.0	51.1	6.0	8.0	7.5
1	Minot Milk Egg Mash	Ryther & Warren	8.9	19.3	17.0	5.8	4.0	53.2	5.6	7.0	7.2
1	Worthmore Breeder Mash	St. Albans Grain Co.	9.5	23.2	20.0	4.5	4.5	48.5	5.5	7.0	8.8
6	Worthmore Laying Mash with Buttermilk	St. Albans Grain Co.	9.7	21.2	20.0	5.0	4.0	51.3	5.2	7.0	7.6
1	Syracold Egg Mash	Syracuse Milling Co.	9.1	19.6	18.0	5.1	3.0	54.8	6.2	8.0	5.2
2	Eggnut	Tioga-Empire Feed Mills, Inc.	9.2	26.2	23.0	5.2	3.0	46.0	5.9	6.0	7.0
2	Ti-O-Ca Laying Food	Tioga-Empire Feed Mills, Inc.	9.7	20.8	18.0	5.3	3.5	51.2	6.4	6.5	6.6
2	United Farmers Milk Egg Mash	United Co-Operative Farmers, Inc.	10.4	18.2	16.5	4.6	4.0	54.2	4.9	6.5	7.7
2	"Made Right" Dry Mash	C. P. Washburn Co.	9.7	20.7	20.0	4.9	4.5	49.4	6.7	6.0	8.6
3	Blue Seal Breeders' Mash	H. K. Webster Co.	9.0	20.0	19.0	4.9	4.0	54.0	4.4	6.0	6.8
3	Blue Seal Milk Mash	H. K. Webster Co.	9.7	19.9	16.5	5.4	4.5	53.1	5.1	6.0	6.8
3	Blue Seal University Laying Mash	H. K. Webster Co.	10.0	18.8	16.5	4.8	4.5	53.7	5.0	6.5	7.7
3	Blue Seal Improved All-Mash Ration	H. K. Webster Co.	10.8	16.2	15.0	4.8	4.5	58.6	3.2	4.0	6.4
2	Pure Feed Eggmaker	West-Nesbitt, Inc.	10.2	20.2	18.0	5.6	4.5	51.5	5.4	7.0	7.1
2	Williams' Dry Mash	Estate of M. G. Williams	9.8	19.9	16.0	5.1	4.0	52.2	5.7	7.0	7.3

**Complete Average Analyses of Feeds Collected (Per Cent)—Continued.**  
**III. POULTRY FEEDS—Concluded.**

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
<b>Fattening and Broiler Feeds.</b>											
1	Wayne Turkey Mash	Allied Mills, Inc.	9.3	16.3	15.0	5.5	3.5	53.1	8.5	8.0	7.3
1	Wayne Poultry Fattener	Allied Mills, Inc.	9.7	16.0	13.5	5.9	4.0	60.6	4.9	6.0	2.9
1	Wonder Complete Broiler Ration	Aracady Farms Milling Co.	10.1	18.4	17.0	5.2	4.0	54.6	4.3	5.0	7.4
2	Wonderfat Station Feed	Aracady Farms Milling Co.	8.6	14.6	12.5	4.9	4.5	63.7	5.2	6.0	3.0
2	Beacon Broiler Feed	Beacon Milling Co., Inc.	9.3	17.4	15.0	5.0	4.0	57.6	4.1	6.0	6.6
1	Crystal Starting Food for Broilers	Curley Brothers	10.0	17.3	16.0	4.8	4.0	59.0	3.4	4.5	5.5
1	Eastern States Broiler Ration	Eastern States Farmers' Exchange	8.6	19.4	18.5	6.0	4.0	54.4	4.6	5.5	7.0
1	Elmore Complete Broiler Ration	Elmore Milling Co., Inc.	10.5	19.5	17.0	7.8	4.0	50.2	4.2	5.0	7.8
1	Larroe Broiler Feed	Larroe Milling Co.	9.4	17.3	15.0	5.1	4.5	55.6	5.2	7.0	7.4
1	Purina Chicken Fat Chow contain- ing Mineral	Purina Mills	8.3	17.4	15.0	4.8	3.0	61.5	4.0	5.0	4.0
1	Purina Chicken Fatena Chow con- taining Mineral	Purina Mills	9.0	14.5	12.0	7.0	3.0	60.2	5.7	6.6	3.6
1	Blue Seal Broiler Ration	H. K. Webster Co.	9.9	18.4	16.5	5.4	4.0	56.5	3.3	4.5	6.5
<b>Chick Grains.</b>											
1	Wayne Chick Feed	Allied Mills, Inc.	11.3	12.4	9.0	4.8	2.0	67.9	1.8	4.0	1.8
1	Coweco Chick Feed	E. A. Cowee Co.	11.8	12.7	9.5	4.2	2.5	68.2	1.6	3.0	1.5
1	Crystal Baby Chick Grains	Curley Brothers	11.6	12.3	10.0	4.3	2.5	68.5	1.5	4.0	1.8
3	Grandin's Baby Chick Feed	D. H. Grandin Milling Co.	12.0	11.6	10.0	3.1	2.5	69.1	2.3	5.0	1.9
3	Larroe Chick Grains	Larroe Milling Co.	9.7	12.0	10.0	2.7	2.0	72.5	1.4	3.5	1.7
1	Narragansett Indian Chick Feed	Narragansett Milling Co.	11.5	12.7	10.0	2.1	2.0	70.6	1.8	2.0	1.3
1	Pratts Circle A Chick Scratch Feed	Pratt Food Co., Inc.	12.9	11.6	10.0	2.6	2.0	64.6	1.1	4.0	7.2
1	Purina Chick Chow	Purina Mills	11.8	12.2	10.0	3.1	2.0	66.9	2.3	4.0	3.7
1	Wirthmore Baby Chick Scratch Feed	St. Albans Grain Co.	11.9	12.6	10.0	4.3	2.5	67.4	1.9	3.5	1.9
<b>Rabbit Feeds.</b>											
1	Beacon Compress Rabbit Feed	Beacon Milling Co., Inc.	7.9	18.9	16.5	4.2	4.0	59.2	4.5	7.0	5.3
1	Wirthmore Rabbit Ration	St. Albans Grain Co.	10.6	16.1	14.0	4.8	3.5	54.3	7.0	9.0	7.2

## IV. ANIMAL PRODUCTS.

Number of Samples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Protein.		Fat.		Phos- phoric Acid.	Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.		
<b>Meat.</b>								
2	Butchers Special Poultry Food . . . . .	Butchers Rendering Co. . . . .	63.7	60.0	10.8	8.0	7.1	17.0
1	Dow's 55% Beef Scraps . . . . .	John C. Dow Co., Inc. . . . .	57.2	55.0	10.7	8.0	8.5	21.2
1	Perfection 55% Poultry Food . . . . .	Lowell Rendering Co. . . . .	57.2	55.0	10.0	8.0	9.1	23.4
1	Marsh's Gem Brand Scraps for Poultry . . . . .	Geo. E. Marsh Co. . . . .	50.9	45.0	14.5	10.0	8.4	23.5
2	Morse's 55% Meat Scraps for Poultry . . . . .	Jas. F. Morse & Co. . . . .	58.5	55.0	12.7	8.0	8.4	25.9
1	Pawtucket High Grade Meat Scrap . . . . .	Pawtucket Rendering Co. . . . .	66.9	60.0	11.0	8.0	6.6	16.6
3	60% Register Brand Meat Scraps . . . . .	John Reardon & Sons Co. . . . .	62.6	60.0	8.5	6.0	8.2	21.2
3	55% Register Brand Meat Scraps . . . . .	John Reardon & Sons Co. . . . .	57.3	55.0	11.7	6.0	8.2	21.8
2	Steamed Meat & Bone . . . . .	N. Roy & Son . . . . .	55.8	50.0	11.6	8.0	8.6	21.7
5	Special Meat Scraps . . . . .	Worcester Rendering Co. . . . .	58.0	55.0	9.2	8.0	9.5	23.8
<b>Meat and Bone.</b>								
2	Butchers Regular Poultry Food . . . . .	Butchers Rendering Co. . . . .	50.1	45.0	10.3	8.0	11.9	29.4
1	Dow's 55% Beef Scraps . . . . .	John C. Dow Co., Inc. . . . .	53.1	55.0	11.6	8.0	10.2	25.7
1	Dow's 45% Beef Scraps . . . . .	John C. Dow Co., Inc. . . . .	48.0	45.0	9.8	8.0	13.3	32.4
1	Meat & Bone Scraps . . . . .	W. D. Higgins Co. . . . .	49.3	45.0	16.2	12.0	11.1	27.9
1	Poultry Food 45% . . . . .	Hinckley Rendering Co. . . . .	53.7	45.0	10.0	5.0	10.2	27.4
1	Perfection Poultry Food . . . . .	Lowell Rendering Co. . . . .	52.5	55.0	10.3	8.0	11.2	28.1
1	Peerless Poultry Food . . . . .	Lowell Rendering Co. . . . .	51.1	50.0	10.2	8.0	11.5	30.3
2	Premium Poultry Food . . . . .	Lowell Rendering Co. . . . .	47.0	45.0	8.3	8.0	14.4	35.2
1	Marsh's Diamond Special Meat Scraps . . . . .	Geo. E. Marsh Co. . . . .	51.4	50.0	9.0	10.0	12.1	29.4
2	Marsh's Gem Brand Scraps for Poultry . . . . .	Geo. E. Marsh Co. . . . .	46.6	45.0	10.7	10.0	12.4	31.4
2	Morse's 50% Meat Scraps for Poultry . . . . .	Jas. F. Morse & Co. . . . .	53.2	50.0	12.0	8.0	10.1	25.3
3	Morse's 45% Meat Scraps for Poultry . . . . .	Jas. F. Morse & Co. . . . .	47.8	45.0	11.4	8.0	10.7	30.4
1	Morse's 40% Meat Scraps for Poultry . . . . .	Jas. F. Morse & Co. . . . .	45.7	40.0	9.2	8.0	13.3	33.4
1	Blue Seal Meat Scraps . . . . .	New England By-Products Corp. . . . .	52.9	50.0	10.5	5.0	11.4	27.5
2	Pawtucket 45% Poultry Feed . . . . .	Pawtucket Rendering Co. . . . .	49.2	45.0	11.1	8.0	12.6	24.0
1	50% Register Brand Meat & Bone Scraps . . . . .	John Reardon & Sons Co. . . . .	53.0	50.0	10.4	6.0	13.1	31.9
8	45% Register Brand Meat & Bone Scraps . . . . .	John Reardon & Sons Co. . . . .	47.2	45.0	10.7	6.0	13.1	33.3
1	Springfield High Grade Poultry Feed . . . . .	Springfield Rendering Co. . . . .	53.4	50.0	8.1	8.0	11.2	27.7
3	Springfield Poultry Feed . . . . .	Springfield Rendering Co. . . . .	48.8	45.0	8.0	8.0	13.3	33.8
2	Prosperity Worcester Poultry Feed . . . . .	Worcester Rendering Co. . . . .	47.5	45.0	9.3	8.0	12.3	32.2



**Complete Average Analyses of Feeds Collected (Per Cent)—Concluded.**  
**IV. ANIMAL PRODUCTS—Concluded.**

Number of Samples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Protein.		Fat.		Phosphoric Acid.	Ash.
			Found.	Guaranteed.	Found.	Guaranteed.		
	<b>Bone Meal.</b>							
1	Bone Meal	Bradley & Baker	8.3	5.0	1.2	—	30.1	80.3
3	Corenco Bone Meal	Consolidated Rendering Co.	25.4	20.0	5.0	3.0	23.2	61.0
1	Dow's Ground Bone for Cattle	John C. Dow Co., Inc.	7.3	8.0	3.1	6.0	17.6	77.3
1	Abattoir Brand Steamed Bone Meal	John-Schmidt Corp.	8.1	5.0	0.9	—	21.9	78.3
1	Brighton Feeding Bone	New England Rendering Co.	11.2	7.0	3.9	3.0	22.2	73.1
2	Pure Raw Bone for Feed	John Reardon & Sons Co.	27.9	25.0	2.5	3.0	23.8	58.5
	<b>Fish.</b>							
1	CICO Cod Liver Meal	Consumers Import Co., Inc.	51.9	50.0	29.7	25.0	1.8	3.3
2	"Gorton's Codfish Meal"	Gorton-Pew Fisheries Co., Ltd.	57.1	55.0	1.8	0.1	14.6	33.9
1	Marden's Pure Cod Liver Meal	Marden-Wild Corp.	53.9	53.0	23.9	25.0	1.3	2.6
1	*Mananar	Philip R. Park, Inc.	45.4	40.0	4.1	3.0	—	17.9
6	Cod & Haddock Fish Meal	John Reardon & Sons Co.	65.3	60.0	2.7	3.0	9.6	22.6
2	Hygrade Pure Cod and Haddock Fish Meal	St. Albans Grain Co.	66.5	63.0	2.0	1.5	9.0	20.5
1	Hygrade Fish Meal	Wilmington Packing Co.	64.1	63.0	2.1	1.5	9.2	22.3
1	Prosperity Worcester Fish Meal	Worcester Rendering Co.	54.8	50.0	6.6	4.0	8.5	30.3
	<b>Milk Products.</b>							
2	Buell-Boston Brand Dried Skim Milk	C. E. Buell, Inc.	35.8	31.0	—	.2	—	6.6
2	"Bison Dried Skim Milk"	Consolidated Feed & Grain Co., Inc.	35.2	30.0	—	.5	—	5.4
2	Dairytea Dried Skim Milk	Dairymen's League Co-Operative Association, Inc.	—	—	—	—	—	—
1	Chikora	Dry Milk Co., Inc.	33.8	33.0	—	.75	—	6.0
1	Pure Dried Skim Milk Powder	Eastern Grain Co.	34.2	35.14	—	1.0	—	6.1
2	Powdered Skim Milk	Fort Schuyler Farms, Inc.	35.4	32.0	—	.75	—	5.5
1	"Hershey's Superior Powdered Skim Milk"	Hershey Creamery Co.	35.8	32.0	—	.25	—	5.8
1	Dried Buttermilk	Land O' Lakes Creameries, Inc.	35.4	32.0	—	.25	—	5.1
1	Oak Lac Dried Buttermilk	Schlusser Brothers	36.0	30.0	—	5.0	—	6.1
1	Oak Lac Pure Dried Skim Milk	Schlusser Brothers	33.9	32.5	—	4.0	—	6.8
3	Sheffield Skim Milk Powder	Sheffield Farms Co., Inc.	37.0	35.0	—	.5	—	5.5
2	Ward's Pure Dried Skim Milk	Ward Dry Milk Co.	36.1	32.0	—	.75	—	5.1

\*Fish, kelp, calcium carbonate.

Summary of Analyses  
Season of 1931-1932.

	Samples.	Brands.	Manu- facturers.
<b>Alfalfa Products</b>			
Alfalfa Meal . . . . .	10	5	5
Alfalfa Leaf Meal . . . . .	13	4	4
Alfalfa Stem Meal . . . . .	1	1	1
<b>Animal and Fish Products</b>			
Bone Meal . . . . .	9	6	6
Fish Meal . . . . .	15	8	8
Meat Scrap . . . . .	22	10	9
Meat and Bone Scrap . . . . .	36	20	12
Milk Powders . . . . .	19	12	11
<b>Brewers and Distillers By-Products</b>			
Brewers Grains . . . . .	9	4	3
Distillers Grains . . . . .	3	2	2
Malt Sprouts . . . . .	1	1	1
Yeast Grains . . . . .	1	1	1
<b>Cereal Meals</b>			
Corn Meal . . . . .	33	—	—
Corn Feed Meal . . . . .	1	1	1
Ground Oats . . . . .	59	—	—
Feeding Oatmeal . . . . .	5	3	3
Provender (Corn and Oats) . . . . .	28	—	—
<b>Corn Products</b>			
Gluten Feed . . . . .	55	9	7
Gluten Meal . . . . .	24	4	4
Hominy Feed . . . . .	42	13	11
<b>Miscellaneous Mill Residues</b>			
Barley Feed . . . . .	2	1	1
Beet Pulp . . . . .	10	2	1
Oat Feed . . . . .	11	4	2
Rye Feed . . . . .	5	1	1
<b>Oil Cake Meals</b>			
Soy Bean Meal . . . . .	6	3	3
Cottonseed Meal . . . . .	64	19	13
Linseed Meal . . . . .	34	10	8
<b>Wheat Products</b>			
Red Dog Flour . . . . .	7	7	5
Wheat Flour Middlings . . . . .	20	12	11
Wheat Standard Middlings . . . . .	28	18	17
Wheat Mixed Feed . . . . .	62	18	17
Wheat Bran . . . . .	71	32	32
<b>Mixtures for Animals</b>			
Calf Meals . . . . .	12	8	8
Dairy Feeds . . . . .	322	134	51
Fitting Rations . . . . .	27	11	8
Hog Feeds . . . . .	10	6	6
Molasses Feeds . . . . .	72	32	23
Rabbit Feeds . . . . .	2	2	2
Stock Feeds . . . . .	61	27	24
<b>Mixtures for Poultry</b>			
Chick Growing and Starting Feeds . . . . .	106	63	34
Chick Scratch Feeds . . . . .	13	9	9
Fattening Feeds . . . . .	14	12	9
Laying Mashies . . . . .	184	79	57
*Miscellaneous . . . . .	78	—	—
Totals . . . . .	1607	612	—

\*Consisting largely of material used by Massachusetts manufacturers in preparing registered feeds.

## Deficiencies

Of the 1,607 feedstuffs collected and examined, only 35 differed appreciably from their guarantees in protein, fat or fiber content. A tabulation of feeds not conforming to guarantee follows.

## Feeds Not Conforming to Guarantees.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
2	1	<b>Arcady Farms Milling Co.</b> Arcady Stock Feed . . . . .	—	—	2.3
8	2	<b>Associated Farmers' Exchanges, Inc.</b> { Mune-May-Ker Fitting Ration . . . . . { Mune-May-Ker Fitting Ration . . . . .	— —	— —	4.9 3.8
1	1	<b>Geo. B. Brown</b> Brown's Laying Mash . . . . .	—	1.3	—
5	1	<b>Cairo Meal and Cake Co.</b> Miss Cairo Brand Prime Quality Cottonseed Meal . . . . .	1.8	—	1.7
2	1	<b>J. Cushing Co.</b> Diamond A Dairy Feed . . . . .	—	—	2.1
7	2	<b>S. P. Davis</b> { Goodluck Brand 41% Prime Quality Cottonseed Meal . . . . . { Goodluck Brand 41% Prime Quality Cottonseed Meal . . . . .	— —	— —	1.5 1.6
1	1	<b>Delaware Mills, Inc.</b> Delaware Calf Food . . . . .	—	1.3	—
4	1	Delco 20% Dairy Feed . . . . .	—	—	1.6
1	1	<b>Dewey Bros. Co.</b> Corn Feed Meal . . . . .	—	—	1.7
2	1	<b>John C. Dow Co., Inc.</b> Dow's 55% Beef Scraps . . . . .	1.9	—	—
1	1	Dow's Ground Bone for Cattle . . . . .	—	1.7	—
1	1	<b>Eastern Grain Co.</b> Eastern Stock Feed . . . . .	—	—	1.4
2	1	<b>Eastern States Farmers' Exchange</b> Eastern States Sixteen . . . . .	—	—	1.4
1	1	<b>Elmore Milling Co., Inc.</b> Elmore's Sugared Feedall . . . . .	—	—	5.1
2	1	Elmore's Sweet Digesto Dairy Feed . . . . .	—	—	3.1
1	1	<b>Fernando Valley Milling &amp; Supply Co.</b> Fernando Ideal Greens (Sun Cured) . . . . .	—	—	2.7
3	1	<b>J. A. Forrest</b> Alpine Feeding Oatmeal . . . . .	—	—	1.3
2	1	<b>Gorton-Pew Fisheries Co., Ltd.</b> "Gorton's Codfish Meal" . . . . .	2.9	—	—
11	1	<b>Humphreys-Godwin Co.</b> Dixie Brand 41% Protein Prime Cottonseed Meal . . . . .	1.2	—	—

## Feeds Not Conforming to Guarantees—Concluded.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
8	2	<b>Jersee Co.</b>			
		{ Just Right Growing Mash . . . . .	—	—	1.3
8	2	{ Just Right Growing Mash . . . . .	—	—	1.1
		{ Just Right Egg Mash . . . . .	—	—	3.1
		{ Just Right Egg Mash . . . . .	—	—	1.2
3	1	<b>Lowell Rendering Co.</b>			
		Perfection Poultry Food . . . . .	2.5	—	—
1	1	<b>Marden-Wild Corp.</b>			
		Marden's Pure Cod Liver Meal . . . . .	—	1.1	—
2	1	<b>Geo. E. Marsh Co.</b>			
		Marsh's Gem Brand Scraps for Poultry . .	—	1.7	—
3	1	<b>Park &amp; Pollard Co.</b>			
		Milk-Maid 24% Sweetened Dairy Ration . .	1.8	—	—
6	1	<b>John Reardon &amp; Sons Co.</b>			
		Cod & Haddock Fish Meal . . . . .	—	1.3	—
6	2	<b>St. Albans Grain Co.</b>			
		{ Wirthmore Laying Mash with Buttermilk .	2.8	—	—
		{ Wirthmore Laying Mash with Buttermilk .	2.1	—	—
2	1	<b>Shellabarger Grain Products Co.</b>			
		Shellabarger Soy Bean Meal . . . . .	2.8	—	1.0
2	1	<b>C. P. Washburn Co.</b>			
		"Made Right" Dry Mash . . . . .	—	—	1.1
2	1	"Made Right" Molasses Dairy Feed . . . .	—	—	1.3

### Certified Ingredients

The feeds listed simply include dairy rations and poultry feeds found on sale and sampled by the inspector. Feeds registered but not sampled are not included.

#### Allied Mills, Inc.

##### Amco 24% Dairy Ration

Corn gluten feed, corn gluten meal, cottonseed oil meal, old process linseed oil meal, wheat standard bran, corn meal, ground oats, dried malt grains, soybean oil meal, ground barley, cane molasses, 1% steamed bone meal, 1% ground limestone and 1% salt.

##### Amco 20% Dairy Ration

Corn gluten feed, corn gluten meal, cottonseed oil meal, old process linseed oil meal, wheat standard bran, corn meal, ground oats, dried malt grains, soybean oil meal, ground barley, cane molasses, 1% steamed bone meal, 1% ground limestone and 1% salt.

##### Amco 20% National Dairy Ration

Corn gluten feed, cottonseed oil meal, old process linseed oil meal, wheat standard bran, corn meal, ground oats, corn distillers' dried grains, peanut oil meal, ground barley, cane molasses, 1% steamed bone meal, 1% ground limestone and 1% salt.

##### Amco 16½% Surene Dairy Ration

Soybean oil meal, corn gluten feed, cottonseed oil meal, old process linseed oil meal, wheat standard bran, corn meal, dried malt grains, ground and bolted screenings from flax, wheat, corn, oats and barley, cane molasses, 1% ground limestone and 1% salt.

##### Red Feather Egg Mash

Meat scraps, wheat standard middlings, corn meal, soybean oil meal, fine ground alfalfa meal, fine ground oats, wheat standard bran, corn gluten feed, 2% ground limestone, 1% steamed bone meal, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

##### Wayne Egg Mash

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, wheat standard bran, corn meal, fine ground oat meal, corn gluten feed, old process linseed oil meal, choice alfalfa meal, soybean oil meal, 2% ground limestone, 1% steamed bone meal, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

##### Wayne Egg Mash with Cod Liver Oil

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, wheat standard bran, corn meal, fine ground oat meal, corn gluten feed, old process linseed oil meal, choice alfalfa meal, soybean oil meal, 2% ground limestone, 1% steamed bone meal, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt and cod liver oil.

##### Wayne All Mash Grower

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, choice alfalfa meal, soybean oil meal, wheat standard bran, 2% ground limestone, 1% steamed bone meal, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

##### Wayne 20% Supreme Dairy Feed

Soybean oil meal, cottonseed oil meal, wheat standard bran, ground and bolted screenings from flax, wheat, corn, oats and barley, cane molasses, 0.5% steamed bone meal, 1% ground limestone, 1% salt, 0.06% iron oxide and 0.007% potassium iodide.

#### A. P. Ames Co.

##### Ames Complete Starting Ration

Cod liver oil, dried milk, ground oat groats, corn meal, wheat bran, wheat middlings, meat scraps, fish meal, alfalfa meal, calcium carbonate and salt.

##### 20% Balanced Ration

White hominy, corn meal, wheat bran, wheat middlings, ground oats, gluten feed, gluten meal, linseed meal, cotton seed meal, calcium carbonate, salt, bone meal, oat meal by-products and molasses.

##### Egg Mash

Corn meal, wheat bran, wheat middlings, pulverized oats, meat scraps, fish scraps, bone meal, calcium carbonate, alfalfa.

##### Growing Mash

Oat meal, corn meal, wheat bran, middlings, meat scraps, fish meal, alfalfa meal, calcium carbonate, salt.

**24% Milk Maker**

Corn meal or hominy, wheat bran, wheat middlings, ground oats, gluten feed, gluten meal, linseed meal, cotton seed meal, calcium carbonate, salt, bone meal, oat meal by-products and molasses.

Arcady Farms Milling Co.

**Arcady Besbet Growing Mash**

Fish meal, meat scraps, dried buttermilk, oat meal, o. p. linseed oil meal, corn gluten feed, corn feed meal, wheat bran, wheat middlings, alfalfa meal, cod liver oil, bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Arcady Besbet Laying Mash**

Fish meal, meat scraps, corn gluten meal, dried buttermilk, oat meal, corn feed meal, corn gluten feed, alfalfa meal, fine ground oats, wheat bran, wheat middlings, cod liver oil, bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Old Colony Feed**

Cottonseed meal, soybean meal, hominy feed, corn gluten feed, o. p. linseed oil meal, dried beet pulp, wheat bran, wheat middlings, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

Associated Farmers' Exchanges, Inc.

**More-Value 20% Dairy Ration**

Corn gluten feed, standard wheat bran, hominy, soy bean meal, linseed oil meal, 41% cottonseed meal, brewers dried grains, molasses, steamed bone meal, calcium carbonate, salt.

**Profit-Maker 24% Dairy Ration**

Cottonseed meal 36%, corn gluten feed, st. wheat bran, old process linseed oil meal, soy bean oil meal, pure ground barley, No. 2 38-lb. pure ground oats, yellow hominy, corn distillers dried grains, molasses, steamed bone meal, calcium carbonate, salt.

**Profit-Maker 20% Dairy Ration**

Corn distillers dried grains, soy bean oil meal, pure ground barley, yellow hominy, old process linseed oil meal, cottonseed meal, corn gluten feed, No. 2 38-lb. pure ground oats, standard wheat bran, molasses, steamed bone meal, calcium carbonate, salt.

**Profit-Maker Starting and Growing Mash**

Corn meal, wheat bran, ground oat groats, wheat flour middlings, dry skim milk, alfalfa leaf meal, steamed bone meal, fish meal, meat scraps, salt.

Beacon Milling Co., Inc.

**Auburn Dairy Feed**

Corn gluten feed, old process linseed oil meal, soy bean oil meal, ground oats, corn meal, ground grain screenings, cottonseed meal, wheat bran, ground barley, brewers' dried grains, molasses, 1% salt, 1% calcium carbonate, 1% calcium phosphate.

**Beacon "20"**

Old process linseed oil meal, cottonseed meal, soy bean oil meal, corn gluten feed, corn gluten meal, corn meal, wheat bran (may contain mill run screenings), corn distiller's dried grains, ground oats, ground barley, 1% salt, 1% calcium phosphate, 1% calcium carbonate.

**Beacon Breeders Mash with Buttermilk**

Dried skimmilk, dried buttermilk, fish meal, meat scrap, alfalfa leaf meal, corn meal, pulverized heavy oats, pulverized barley, corn gluten meal, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), soy bean oil meal, old process linseed oil meal, cod liver oil,  $\frac{1}{2}\%$  fine salt, 3% calcium carbonate, 2% calcium phosphate, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Beacon's Cayuga Growing Mash**

Dried skimmilk, fish meal, meat scrap, old process linseed oil meal, pulverized heavy oats, corn meal, pulverized barley, wheat bran, wheat middlings, alfalfa leaf meal, 2% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}\%$  salt.

**Beacon's Cayuga Laying Mash with Buttermilk**

Dried buttermilk, dried skimmilk, fish meal, meat scrap, corn meal, alfalfa leaf meal, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), soy bean oil meal, pulverized barley, corn gluten meal, pulverized heavy oats, 3% calcium carbonate, 2% calcium phosphate,  $\frac{1}{2}\%$  salt.

**Beacon Complete Starting Ration**

Dried skimmilk, meat scrap, fish meal, ground corn, ground hulled oats, pulverized heavy clipped oats, pulverized heavy barley, wheat bran (may contain mill run screenings), old process linseed oil meal, wheat red dog flour, alfalfa leaf meal, cod liver oil, 2% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}\%$  salt, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Beacon Dairy Ration**

Old process linseed oil meal, soy bean oil meal, corn gluten feed, corn distiller's dried grains, ground barley, corn gluten meal, hominy feed, corn meal, cottonseed meal, alfalfa meal, wheat bran, wheat middlings, 1% calcium carbonate, 1% calcium phosphate, 1% salt.

**Beacon Duck Starter**

Dried skim milk, fish meal, meat scrap, wheat bran (may contain mill run screenings), wheat low grade flour, corn meal, special ground oat groats, alfalfa leaf meal, cod liver oil, 1% calcium carbonate,  $\frac{1}{4}$ % calcium phosphate,  $\frac{1}{4}$ % salt, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Beacon Egg Mash with Buttermilk**

Dried buttermilk, dried skim milk, meat scrap, fish meal, corn gluten meal, soy bean oil meal, old process linseed oil meal, pulverized barley, pulverized heavy oats, corn meal, alfalfa leaf meal, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), 3% calcium carbonate, 2% calcium phosphate,  $\frac{1}{2}$ % fine salt, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Beacon Growing Mash**

Dried skim milk, meat scrap, fish meal, old process linseed oil meal, pulverized heavy oats, pulverized barley, corn meal, wheat red dog, alfalfa leaf meal, wheat bran wheat middlings, 3% calcium carbonate, 2% calcium phosphate,  $\frac{1}{2}$ % salt, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Beacon Special Coccidiosis Mash**

Dried skim milk, ground yellow corn, pulverized barley, wheat bran, cod liver oil,  $\frac{1}{2}$ % calcium phosphate,  $2\frac{1}{2}$ % calcium carbonate.

**Beacon Sweet "24"**

Old process linseed oil meal, soy bean oil meal, corn gluten meal, cottonseed meal, corn gluten feed, corn meal, brewers' dried grains, corn distiller's dried grains, wheat bran (may contain mill run screenings), ground oats, ground barley, molasses, 1% salt, 1% calcium carbonate.

**Beacon Sweet "20"**

Old process linseed oil meal, soy bean oil meal, corn distiller's dried grains, cottonseed meal, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), corn gluten meal, corn gluten feed, ground barley, corn meal, ground oats, molasses, 1% calcium carbonate, 1% salt.

**Beacon Turkey Growing Feed**

Dried skim milk, alfalfa leaf meal, old process linseed oil meal, soy bean oil meal, meat scraps, fish meal, wheat bran, wheat middlings, wheat red dog flour, pulverized heavy oats, pulverized barley, corn meal, 4% calcium carbonate, 2% calcium phosphate,  $\frac{1}{2}$ % salt,  $1\frac{1}{2}$ % Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Chariot Starter & Grower**

Dried skim milk, fish meal, meat scrap, old process linseed oil meal, pulverized heavy oats, corn meal, pulverized barley, wheat bran, wheat middlings, alfalfa leaf meal, cod liver oil, 2% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}$ % salt.

**Berkshire Coal & Grain Co., Inc.****Berkshire Hills Sweet Dairy Feed**

Molasses, wheat bran, ground barley, ground oats, gluten feed, linseed meal, cottonseed meal, wheat middlings, corn meal, calcium carbonate, bone meal, salt.

**Green Mountain Dairy Ration**

Cottonseed meal, wheat bran, ground oats, ground barley, gluten feed, hominy and oil meal, salt, and calcium carbonate.

**Green Mountain Laying Mash**

Corn meal, ground oats, wheat middlings, gluten feed, linseed meal, rolled oats & fine ground alfalfa, wheat bran, fine ground meat & fish scraps, charcoal, calcium carbonate & fine salt.

**Black Rock Milling Corp.****Bidwell 24% Dairy Ration**

Wheat bran, linseed oil meal, ground barley, cottonseed meal, corn gluten feed, fine ground grain screenings, malt sprouts, corn gluten meal, molasses, calcium carbonate and salt.

**Bidwell 20% Dairy Ration**

Wheat bran, linseed oil meal, malt sprouts, gluten feed, gluten meal, ground barley, cottonseed meal, fine ground grain screenings, molasses, calcium carbonate and salt.

**Bidwell Dry-Mash**

Dried buttermilk, alfalfa meal, corn meal, standard wheat bran and wheat middlings (may contain mill run of screenings), fish meal, meat, bone, linseed oil meal, gluten meal, soy bean meal, calcium carbonate, salt, and ground: wheat, barley, kaffir corn and buckwheat.

**Borden Grain Co.****Borden's Chick Starting Feed**

Wheat bran, wheat middlings, corn meal, ground oat meal, alfalfa leaf meal, meat scrap, fish meal, dried milk, calcium carbonate, salt, bone meal.



## **Borden's Dairy Feed**

Wheat bran, wheat middlings, corn meal or hominy, gluten meal, cotton seed meal, linseed feed, linseed oil meal, calcium carbonate, bone meal, salt.

## **Borden's Laying Mash**

Corn meal, wheat bran, wheat middlings, ground oatmeal, dried milk, alfalfa leaf meal, fish meal, meat scrap, calcium carbonate, salt, may contain cod liver oil.

**Geo. B. Brown**

## **Brown's Dairy Feed**

Wheat bran, hominy feed, oat feed, cotton seed meal, calcium carbonate, o. p. linseed meal, corn gluten feed, molasses, bone meal.

## **Brown's Laying Mash**

Corn meal, wheat midds, wheat bran, pulv. oats, bone meal, corn gluten feed, meat scraps, dried milk,  $\frac{1}{2}\%$  salt, calcium carbonate.

**Butman Grain & Feed Co.**

## **Climax Growing Feed**

Ground corn and oats, wheat middlings, beef scraps, dried milk, bone meal, calcium carbonate, charcoal and salt.

## **Climax Laying Mash**

Corn meal, bran, middlings, ground wheat, ground oats, beef and fish scraps, alfalfa meal, calcium carbonate and buttermilk, salt.

**Chapin & Co.**

## **Chapin Kernels Lay-All**

Dried buttermilk, fish meal, meat scraps, corn gluten meal, alfalfa leaf meal, corn oil meal, wheat flour, pulverized oats, yellow corn meal, wheat bran, milo, wheat middlings, yellow hominy feed, ground barley, molasses, salt, charcoal, bone meal, not over 2% calcium carbonate, cod liver oil.

**Coles Co.**

## **Fortune Egg Mash**

Ground corn, wheat, oats, barley, kaffir corn, buckwheat, alfalfa, wheat bran, wheat flour midds, old process linseed meal, corn gluten feed, corn germ meal, hominy, dried buttermilk, fish meal, bone and meat meal, calcium carbonate, 1% salt. (Wheat bran & wheat middlings may contain screenings not to exceed mill run.)

**Community Feed Stores, Inc.**

## **Community 20% Dairy Ration**

41% Cottonseed meal, o. p. linseed meal, gluten feed, yellow corn meal or hominy, ground oats, wheat bran, wheat middlings, molasses, steamed bone meal, salt, calcium carbonate.

## **Community Milk Laying Mash**

Hominy or corn meal, ground oats, gluten feed, wheat bran, wheat middlings, meat scraps, dried milk, alfalfa meal, salt, bone meal, calcium carbonate.

## **Hilltop 20% Dairy Ration**

41% Cottonseed meal, o. p. linseed meal, gluten feed, hominy or corn meal, Sugared Vim (oatfeed-molasses), wheat bran, bone meal, salt, calcium carbonate.

**Nicolas Courcy**

## **Courcy's Eastern Laying Mash**

Yellow corn meal, wheat bran, wheat middlings, feeding oat meal, alfalfa leaf meal, dry or skim milk, 50% beef scraps, fish meal, bone meal, salt, calcite flour, with 1% cod liver oil or without.

## **Courcy's Growing Feed**

Wheat bran, middlings, yellow corn meal, feeding oat meal, 50% scraps, linseed oil meal, bone meal, fish meal, calcite flour, leaf meal, milk, salt.

## **Eastern Dairy Feed**

Bran, wheat middlings, Diamond gluten, 41% or 43% cottonseed, 34% linseed meal, yellow corn meal or hominy, salt, calcite flour.

## **Eastern Starting Feed**

Bran, middlings, yellow corn meal, ground oat groats, bone meal, dry or skim milk, leaf meal, fish meal, 60% beef scraps, cracked wheat, hulled oats, fine salt, calcite flour, 1% cod liver oil or cod liver meal.

**Cover & Palm Co.**

## **The Perfect Dry Mash**

Alfalfa meal, hominy feed, corn meal, wheat mixed feed, animal meal, gluten feed, linseed oil meal, beef scraps, oats, and oat feed, kaffir corn meal, dried buttermilk.

**E. A. Cowee Co.**

## **Coweco Growing Mash**

Wheat bran and middlings, corn meal, oat meal, meat scraps, fish meal, buttermilk, edible bone meal, calcium carbonate, salt, with or without cane molasses, with or without cod liver oil.

**Coweco Laying Mash**

Wheat bran and middlings, oat meal, gluten feed, linseed meal, meat scraps, fish meal, corn meal, buttermilk, alfalfa meal, edible bone meal, calcium carbonate, salt, with or without cane molasses, with or without cod liver oil.

**Coweco Lo-Price 20% Dairy Ration**

Bran, middlings, ground oats, cottonseed meal, corn meal, gluten meal, linseed meal, ground barley, soya bean meal, cane molasses, bone meal, calcium carbonate and salt.

**Coweco 1925 Ration**

Wheat bran and middlings, corn meal, cottonseed meal, gluten feed, linseed meal, hominy, ground oats, brewers' grains, soya bean meal, edible bone meal, salt, calcium carbonate, and molasses.

**Coweco 20% Ration**

Wheat bran and middlings, gluten feed, corn meal, linseed meal, soya bean meal, ground oats, cottonseed meal, brewers' grains, molasses, edible bone meal, calcium carbonate and salt.

**Coweco Starting Mash**

Corn meal, oat meal, wheat bran and middlings, alfalfa leaf meal, fish meal, meat scraps, edible bone meal, buttermilk, calcium carbonate, salt, with or without molasses, with or without cod liver oil.

**Curley Brothers****Crystal 24% Dairy Ration**

Corn gluten meal, corn gluten feed, cottonseed meal, linseed oil meal, distillers grains, hominy feed, ground barley, ground oats, bran, middlings, edible bone meal, salt, calcium carbonate.

**Crystal Dairy 20 Ration**

Corn gluten feed, yellow corn meal, hominy feed, bran, middlings, cottonseed meal, linseed oil meal, beet pulp, steamed edible bone meal, calcium carbonate, salt.

**Crystal Egg Mash (with Dried Milk)**

Yellow hominy feed, yellow corn meal, bran, middlings, feeding oatmeal, red dog flour, alfalfa poultry greens, beef scraps, fish scraps, steamed bone meal, dried skim milk, salt, calcium carbonate.

**Crystal Growing Mash (with Dried Milk)**

Cod liver oil, dried skim milk, meat scraps, white fish meal, steamed edible bone meal, alfalfa poultry greens, red dog flour, bran, middlings, feeding oatmeal, yellow hominy feed, yellow corn meal, salt, calcium carbonate.

**J. Cushing Co.****Big C Mash**

Corn feed meal (or yellow hominy), mixed feed heavy, gluten feed, oil meal, meat scraps 45%, alfalfa fine ground, ground oats, bone meal, calcium carbonate, salt.

**Big C Special Dairy Feed**

36% Cottonseed meal, old process oil meal, hominy, corn gluten feed, wheat bran, wheat midds, ground oats, salt, steamed bone meal, calcium carbonate.

**Diamond A Dairy Feed**

Corn meal, old process oil meal, gluten feed, wheat bran, dried brewers grains, gluten meal, 36% cottonseed meal, Stock Feed, salt, calcium carbonate.

**Diamond C Dairy Feed**

Wheat bran, wheat midds, hominy (or corn meal), 36% cottonseed meal, old process oil meal, beet pulp, gluten feed, gluten meal, salt.

**Quality 24% Dairy**

Wheat bran, brewers grains, ground oats, corn feed meal, coconut oil meal, old process oil meal, gluten feed, cottonseed meal, soy bean meal, molasses, 1% bone meal, 1% ground limestone, 1% salt.

**Quality 20% Dairy Feed**

Corn feed meal, ground oats, soy bean meal, brewers grains, chaff & screenings, coconut oil meal (or copra meal), wheat bran, gluten feed, 41% cottonseed meal, old process oil meal, cane molasses, calcium carbonate, steamed bone meal, salt.

**Quality Laying Mash**

Corn feed meal, ground or pulverized oats, alfalfa meal, wheat midds, wheat bran, gluten feed, old process oil meal, calcium carbonate, 45% meat scraps, steamed bone meal, fish meal, dried buttermilk or dried skim milk, salt.

**Sweet 20 Dairy Feed**

Corn feed meal, gluten feed, gluten meal, Hexite (or hominy), oat feed, bran, cottonseed meal, barley meal, salt, calcium carbonate, molasses.

**Vigor 16% Dairy**

Corn gluten feed, dried brewers grains, cottonseed meal, soy bean meal, cane molasses, coconut oil meal, old process oil meal, wheat midds, wheat bran, oatmeal by-products (oat midds, oat hulls, oat shorts), reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

## Cutler Co.

**King 20 Dairy Feed Sweetened**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, pure ground oats, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

**King Dairy Feed with Beet Pulp Sweetened**

Dried beet pulp, cottonseed meal, old process linseed meal, wheat bran, wheat middlings, corn gluten feed, yellow corn meal, pure ground oats, edible bone meal, pure cane molasses and dairy salt.

## Delaware Mills, Inc.

**Delaware All Mash Chick Food**

Cod liver oil, dried skim milk, meat scrap, fish meal, oatmeal, linseed oil meal, alfalfa leaf meal, corn meal, wheat bran, wheat middlings, wheat meal, bone meal, calcium phosphate, charcoal, salt.

**Delaware Growing Mash (with Dried Skim Milk)**

Dried skim milk, alfalfa leaf meal, meat scrap, fish meal, bone meal, linseed oil meal, corn gluten feed, corn feed meal, wheat bran, wheat middlings, wheat flour middlings, oat meal, wheat meal, calcium phosphate,  $\frac{1}{2}$  of 1% salt.

**Delco 24% Dairy Feed.**

Linseed oil meal, corn gluten feed, cocoanut oil meal, peanut meal, cottonseed meal, wheat bran (which may contain mill run screenings), wheat middlings, corn meal, calcium carbonate, salt.

**Delco 20% Dairy Feed**

Dried beet pulp, linseed oil meal, corn gluten feed, corn gluten meal, cocoanut oil meal, peanut meal, cottonseed meal, wheat bran, wheat middlings, hominy feed, ground oats, salt, calcium carbonate.

**Indian Laying Mash (with Dried Skim Milk)**

Dried skim milk, meat scrap, fish meal, bone meal, linseed oil meal, corn gluten feed, alfalfa meal, wheat bran, wheat middlings, corn feed meal, ground barley, ground oats, cottonseed meal, calcium phosphate, and salt.

## F. Diehl &amp; Son, Inc.

**Diehl's Dairy Feed**

Bran, brewers grains, cottonseed meal, gluten, linseed meal, corn meal, oat meal mill by-products, ground barley, pure ground oats, wheat middlings, salt, calcium carbonate, bone meal, sweetened.

**Diehl's Dry Mash**

Alfalfa. Banner Feed, bone, buttermilk, charcoal, fish scraps, gluten meal, linseed meal, meat scraps, middlings and red dog.

## Eastern Grain Co.

**Eastern All-Purpose Chick and Broiler Ration**

Yellow corn meal, wheat bran, wheat middlings, ground oat groats, high grade meat scraps, fish scraps, dried milk powder, edible bone meal, calcium carbonate, fine salt, pure cod liver meal, vitamin tested cod liver oil, leaf alfalfa meal.

**Eastern All-Purpose Dairy Feed**

Bran, middlings, corn meal, ground barley, oatmeal mill by-products (oat middlings, oat shorts, oat hulls), linseed meal, gluten feed, gluten meal, cottonseed meal, pure cane molasses, high grade edible bone meal.

**Eastern Complete Ration for Layers**

Wheat bran, ground wheat, oat groats, ground yellow corn, high grade beef scraps, fish meal, dried milk, alfalfa leaf meal, edible bone meal, calcium carbonate, fine salt, wheat middlings, pure cod liver meal.

**Eastern 24% Dairy Feed Sweetened**

Bran, middlings, cottonseed meal, linseed meal, distillers, ground oats, Buffalo gluten, peanut meal, Diamond gluten, ground barley, corn meal, pure cane molasses, high grade edible bone meal, salt, calcium carbonate.

**Eastern 20% Dairy Feed Sweetened**

Bran, middlings, cottonseed meal, linseed meal, distillers grains, ground oats, Buffalo gluten, peanut meal, Diamond gluten, ground barley, corn meal, pure cane molasses, high grade edible bone meal, calcium carbonate, salt.

## Eastern States Farmers' Exchange

**Eastern States Developer with Cod Liver Oil**

E. S. No. 2 yellow corn meal—attrition, standard wheat bran, wheat flour middlings, E. S. barley—ground, E. S. pure ground oats (No. 2—38 lb. clipped—unsul.), dry skim milk, soy bean oil meal, alfalfa leaf meal, E. S. meat scraps 50%, pure fish meal 55%, dicalcium phosphate, oyster shell meal, cod liver oil, salt.

**Eastern States Fulpail Dairy Ration**

Standard wheat bran, choice yellow hominy, E. S. pure ground oats (No. 2—38 lb. clipped—unsul.), corn gluten feed, E. S. choice cottonseed meal, soy bean oil meal, old process linseed oil meal—pure, corn distillers' dried grains, molasses, dicalcium phosphate, salt.

**Eastern States Highland 20**

E. S. choice cottonseed meal, oat shorts, oat middlings, oat hulls, choice yellow hominy, dried brewers grains, standard wheat bran, molasses, soy bean oil meal, corn gluten meal, dicalcium phosphate, salt.

**Eastern States Highland 16**

Choice yellow hominy, oat shorts, oat middlings, oat hulls, standard wheat bran, dried brewers grains, E. S. choice cottonseed meal, molasses, corn gluten meal, soy bean oil meal, dicalcium phosphate, salt.

**Eastern States Milk Egg Mash with Cod Liver Oil**

E. S. No. 2 yellow corn meal—attrition, standard wheat bran, wheat flour middlings, E. S. pure ground oats (No. 2—38 lb. clipped—unsul.), E. S. meat scraps 50%, pure fish meal 55%, alfalfa leaf meal, dry skim milk, oyster shell meal, cod liver oil, dicalcium phosphate, salt.

**Eastern States Milkmore Dairy Ration**

E. S. choice cottonseed meal, choice yellow hominy, corn gluten feed, soy bean oil meal, standard wheat bran, E. S. pure ground oats (No. 2—38 lb. clipped—unsul.), old process linseed oil meal—pure, corn distillers' dried grains, molasses, dicalcium phosphate, salt.

**Eastern States Sixteen**

Choice yellow hominy, standard wheat bran, E. S. pure ground oats (No. 2—38 lb. clipped—unsul.), E. S. choice cottonseed meal, corn gluten feed, old process linseed oil meal—pure, corn distillers' dried grains, molasses, dicalcium phosphate, salt.

**Eastern States Turkey-Start**

E. S. No. 2 yellow corn meal—attrition, E. S. meat scraps 50%, standard wheat bran, dry skim milk, wheat flour middlings, ground oat groats, pure fish meal 55%, alfalfa leaf meal, cod liver oil, oyster shell meal, dicalcium phosphate, salt.

Michael W. Ellis

**The Ellis Dairy Feed**

Corn meal, wheat middlings, wheat bran, gluten meal, hominy feed, gluten feed, corn distillers grains, cottonseed meal, oil meal, ground oats, calcite flour, salt, edible bone meal. (Wheat feeds may contain screenings not exceeding mill run.)

**The Ellis Poultry Mash**

Wheat bran, wheat middlings, hominy feed, gluten feed, corn meal, rolled oats or feeding oatmeal, alfalfa leaf meal, cod liver oil, beef scraps, dried skim milk or buttermilk, edible bone meal, salt, charcoal, calcite flour. (Wheat feeds may contain screenings not exceeding mill run.)

Elmore Milling Co., Inc.

**Elmore Growing Mash**

Dried buttermilk, meat meal, bone meal, wheat midds, wheat bran, low grade wheat flour, alfalfa leaf meal, corn meal, oat flake, gluten feed, salt, cod liver oil.

**Elmore Milk Grains**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers grains, calcium carbonate, salt.

**Economilk Dairy Feed**

Wheat bran, wheat midds, ground barley, cottonseed meal, corn gluten feed, hominy feed, soybean meal, cane molasses, reground wheat screenings, calcium carbonate, salt.

**Elmore Chixsaver**

Dried milk, wheat flour midds, wheat bran, corn meal, alfalfa leaf meal, oat flour, meat & bone meal, fish meal, cod liver oil, fine table salt.

**Elmore's Economilk 24% Dairy Feed**

Wheat bran, wheat middlings, cotton seed meal, ground whole barley, soybean meal, corn gluten feed, cane molasses, reground wheat screenings, calcium carbonate, salt.

**Elmore Eggmaker**

Dried buttermilk, meat & bone meal, wheat bran, wheat red dog midds, corn meal, fish meal, ground oats, calcium carbonate, salt.

**Elmore Egg Mash**

20% dried buttermilk and meat scraps, 2nd clear wheat flour, pure ground oats, wheat middlings, alfalfa leaf meal, corn meal or hominy feed, wheat bran, cod liver oil, not more than 1% calcium carbonate, salt.

**Elmore's Sweet Digesto Dairy Feed**

Corn gluten feed, cottonseed meal, wheat bran, linseed oil meal, cocoanut oil meal, pulverized wheat screenings, oat meal mill by-products (oat hulls, oat midds and oat shorts), cane molasses, salt.

**Otsego Economy Ration**

O. p. oil meal, cottonseed meal, corn gluten feed, wheat bran, corn gluten meal, corn meal, cane molasses, copra oil meal, phosphatic calcium carbonate, ground oats, salt.

## John W. Eshelman &amp; Sons

**Eshelman Certified 20% Dairy Ration**

Corn gluten feed, choice hominy feed, pure grd. 38 lb. No. 2 white clipped oats, 34% pro. o. p. oil meal, standard wheat bran, 41% pro. cottonseed meal, soybean oil meal, standard wheat middlings, corn distillers' dried grains, cane molasses, steamed bone meal, calcium carbonate, salt.

**Eshelman Conestoga 20 Dairy Feed**

Wheat bran, corn gluten feed, dried brewers' grain, cottonseed meal, cane molasses, wheat middlings, soybean oil meal, cocoanut oil meal, o. p. oil meal, oat meal mill by-product (oat midds, oat hulls, oat shorts), reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Lancaster 20 Dairy Feed**

Wheat bran, corn gluten feed, wheat middlings, dried brewers' grains, cane molasses, cottonseed meal, soybean oil meal, corn feed meal, ground oats, cocoanut oil meal, o. p. oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Red Rose 24 Dairy Feed**

Wheat bran, wheat middlings, corn gluten feed, dried brewers' grains, cocoanut oil meal, cottonseed meal, o. p. oil meal, soybean oil meal, cane molasses, corn feed meal, ground oats, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Red Rose Laying Mash**

Wheat middlings, corn meal, meat scrap, wheat bran, corn gluten feed, ground oats, o. p. oil meal, fish meal, hominy feed, 3% fine alfalfa meal, 1½% milk sugar feed (dried whey), 1½% dried buttermilk, ½% salt.

## Flory Milling Co., Inc.

**Flory's Egg Mash with Cod Liver Oil**

Ground oat groats, dried buttermilk, milk sugar feed, wheat flour middlings, yellow corn meal, corn gluten meal, wheat bran, fine ground barley, meat meal, fish meal, alfalfa leaf meal, linseed oil meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil, crab meal.

## Fred A. Fountain

**Fountain's Buttermilk Growing Feed**

Dry buttermilk or dry skimmilk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, table salt.

**Fountain's Buttermilk Laying Mash**

Dry buttermilk or dry skimmilk, beef scrap, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, fish meal, table salt.

**Fountain's Buttermilk Starting Feed**

Dry buttermilk or dry skimmilk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, calcium carbonate, table salt.

## J. B. Garland &amp; Son

**Garland's Economy 20% Dairy Ration**

Bran, middlings, cottonseed meal, gluten meal, linseed meal, ground barley, soy bean meal, cane molasses, bone meal, calcium carbonate and salt.

**Garland's Fancy Chick Mash**

Wheat bran and middlings, oat meal, corn meal, alfalfa leaf meal, meat scraps, bone meal, fish scraps, dried buttermilk, calcium carbonate, salt and cod liver oil.

**Garland's Poultry Mash**

Wheat bran and middlings, corn meal, gluten meal, oat meal, alfalfa, meat scraps, fish meal, dried milk, calcium carbonate, salt, bone meal. (With or without cod liver oil.) (With or without cane molasses.)

**Garland's 24% Ration**

Wheat bran, middlings, corn meal, hominy, gluten feed, linseed meal, cottonseed meal, soy bean meal, ground oats, brewers grains, calcium carbonate, salt and cane molasses.

**Royal Worcester Complete Ration**

Gluten feed, linseed, ground oats, wheat bran, middlings, corn meal, cottonseed meal, soy bean meal, beet pulp, salt, calcium carbonate, bone meal and cane molasses.

## General Mills, Inc.

**Eventually Gold Medal Dairy Ration**

Wheat bran, wheat germ, standard wheat middlings with ground grain screenings not exceeding mill run, pulverized oats, yellow corn meal, corn gluten feed, cottonseed meal, linseed oil meal, phosphatic limestone 23½%, salt ¾%.

**Eventually Gold Medal Egg Mash for Breeding and Laying with Dried Buttermilk**

Yellow corn meal, standard wheat middlings with ground grain screenings not exceeding mill run, corn gluten feed, wheat red dog, fine ground oat groats, alfalfa meal, wheat germ, linseed oil meal, sifted meat scraps, dried buttermilk, phosphatic limestone 1%, salt  $\frac{1}{2}\%$ .

**Eventually Gold Medal Growing Mash with Dried Buttermilk**

Corn oil meal, yellow corn meal, standard wheat middlings with ground grain screenings not exceeding mill run, fine ground oat groats, alfalfa meal, sifted meat scraps, dried buttermilk, wheat germ, phosphatic limestone  $2\frac{1}{4}\%$ , salt  $\frac{3}{4}\%$ .

W. K. Gilmore & Sons, Inc.

**"Neponset Poultry Mash"**

Wheat bran, wheat middlings, corn meal, ground oats, alfalfa, beef scraps, fish scraps, linseed oil meal, corn gluten feed, ground rolled oats, calcite flour, dried skim milk, fine salt.

D. H. Grandin Milling Co.

**Grandin's Baby Chick Starter with Buttermilk—Cod Liver Oil**

Dried buttermilk, fine ground hulled oats, ground wheat, corn meal, hominy feed, wheat middlings, alfalfa leaf meal, calcium carbonate, bone meal, one half of one per cent salt and cod liver oil.

**Grandin's 24% Balanced Dairy Ration**

Distillers dried grains, cottonseed meal, cocoanut oil meal, linseed oil meal, corn gluten feed, wheat bran, wheat middlings, hominy feed, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Complete Starting Ration with Buttermilk—Cod Liver Oil**

Dried buttermilk, cod liver oil, ground meat and bone, fish meal, wheat bran, wheat middlings, alfalfa leaf meal, hominy feed, ground yellow corn, pulverized oats, ground wheat, ground hulled oats, ground barley, calcium carbonate and salt.

**Grandin's Growing Mash with Buttermilk**

Ground meat and bone, dried buttermilk, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, alfalfa meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Growing Mash with Buttermilk—Cod Liver Oil**

Ground meat and bone, dried buttermilk, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, alfalfa meal, bone meal, calcium carbonate, salt and cod liver oil. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Laying Mash with Buttermilk**

Ground fish, ground meat and bone, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, powdered buttermilk, alfalfa meal, calcium carbonate and a small percentage of salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Laying Mash with Buttermilk—Cod Liver Oil**

Ground fish, ground meat and bone, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, powdered buttermilk, alfalfa meal, calcium carbonate, a small percentage of salt and cod liver oil. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Milk Maker**

Linseed oil meal, cottonseed meal, cocoanut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, beet pulp, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 24% Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 16% Dairy Feed.**

Linseed oil meal, cottonseed meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground barley, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's 12 Twin Six 12 Dairy Feed**

Linseed oil meal, cottonseed meal, cocoanut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, alfalfa meal, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)



## **M-S (Money Saver) 20% Sweet Dairy Feed**

Cottonseed meal, corn gluten feed, linseed oil meal, wheat bran, wheat middlings, ground barley, corn meal, corn feed meal, hominy feed, ground grain screenings, oat meal by-products (oat middlings, oat hulls, oat shorts), cane molasses, steamed bone meal, calcium carbonate and salt.

**Great Atlantic & Pacific Tea Co.**

## **Daily Egg Mash Feed.**

Ground oats, ground barley, soybean oil meal, old process linseed oil meal, corn gluten meal, wheat standard middlings, wheat bran, alfalfa meal, corn feed meal, dried buttermilk, dried skim milk, meat and bone scrap, fish meal, flour middlings, cod liver oil, cod liver meal, calcium carbonate from limestone 2.5%, steamed bone meal 1½%, salt ½%, red iron oxide 1-10% and .0015% potassium iodine.

**Hales & Hunter Co.**

## **Morning Glory Egg Mash with Dried Buttermilk**

Corn feed meal, ground oats, wheat bran, wheat middlings, corn gluten feed, soy bean meal, alfalfa meal, dried buttermilk, meat scraps and not over 5% minerals, (calcium carbonate, granulated charcoal and salt.)

## **Red Comb Egg Mash with Dried Buttermilk**

Corn feed meal, feeding oat meal, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean meal, dried buttermilk and not over 5% minerals, (calcium carbonate, sodium chloride, steamed bone meal, granulated charcoal, iron sulphate, sulphur.)

**Horvitz Grain Co.**

## **Make M-Lay Laying Mash**

Wheat bran, corn meal, gluten feed & gluten meal, ground oats, ground barley, red dog, wheat middlings, linseed meal, meat scraps, calcium carbonate, charcoal.

## **Open Formula Mash**

Coarse corn meal, wheat bran, white middlings, ground oats 40-42, meat scraps 55% protein, alfalfa leaf meal, steamed bone meal, dried milk, common salt.

## **Wantmore Dairy Ration**

Hominy feed or corn meal, wheat bran, ground oats, gluten feed & gluten meal, linseed meal, cottonseed meal, wheat middlings, salt, calcium carbonate.

## **Wantmore Dairy with Beet Pulp**

Hominy feed or corn meal, wheat bran, gluten feed & gluten meal, linseed meal, cottonseed meal, wheat middlings, salt, beet pulp, calcium carbonate.

**Jersee Co.**

## **Just Right Egg Mash**

Meat scraps, charcoal, ground bone, salt, wheat middlings, wheat bran, ground oats, ground corn, powdered whole & skim milk, St. John's bread, starch, calcium phosphate, anise, dried blood, oxide iron, fish meal and alfalfa meal.

**Larroe Milling Co.**

## **Larro—The Ready Ration for Dairy Cows**

Cottonseed meal, yellow corn meal, standard wheat middlings (with ground grain screenings not exceeding mill run), o. p. linseed oil meal, corn gluten feed, dried beet pulp, wheat bran, ¾% salt.

## **Larro Chick Starter**

Oatmeal, yellow corn meal, standard wheat middlings (with ground grain screenings not exceeding mill run), dried skimmilk, dried buttermilk, meat and bone scraps, wheat bran, alfalfa meal, cod liver oil vitamin extract, ½% salt, 1½% phosphatic limestone.

## **Larro Egg Mash**

Oatmeal, standard wheat middlings (with ground grain screenings not exceeding mill run), yellow corn meal, alfalfa meal, wheat bran, meat and bone scraps, dried buttermilk, dried skimmilk, cod liver oil vitamin extract, 2½% phosphatic limestone, ¾% salt.

## **Larro Growing Mash**

Yellow corn meal, oatmeal, wheat bran, standard wheat middlings (with ground grain screenings not exceeding mill run), meat and bone scraps, dried buttermilk, dried skimmilk, alfalfa meal, cod liver oil vitamin extract, 2% phosphatic limestone, ½% salt.

**Mansfield Milling Co.**

## **"Mansfield" Chick-Growing-Feed**

Wheat bran, red dog flour, corn meal, oat meal, fish scraps, meat scraps, dried milk and charcoal.

## **"Mansfield" Cow-Ration**

Wheat bran, corn meal, ground oats, ground barley, cotton seed meal, linseed meal, gluten feed, gluten meal and salt.



**"Mansfield" Dry-Poultry-Mash**

Wheat bran, wheat middlings, red dog flour, corn meal, gluten feed, dried milk and meat scraps.

Maritime Milling Co., Inc.

**B B Bull Brand Dairy Ration**

Dried brewers grains, o. p. linseed oil meal, cotton seed meal, corn gluten feed, soya bean meal, hominy feed, corn meal, wheat bran, wheat middlings, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Sweetened B. B. Bull Brand "24" Dairy Ration**

Dried brewers grains, o. p. linseed oil meal, cotton seed meal, corn gluten feed, soya bean meal, hominy feed, corn meal, wheat bran, wheat middlings, molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**B-B Hi-Test Dairy Feed 20% Protein Sweetened**

Dried brewers grains, o. p. linseed oil meal, cotton seed meal, corn gluten feed, soya bean meal, hominy feed, ground oats, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

**B-B Marmico 16% Protein Dairy Feed with Molasses**

Dried brewers grains, soya bean meal, cotton seed meal, corn gluten feed, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, oat hulls, oat shorts, oat midds, molasses, steamed bone meal, calcium carbonate and salt.

Mennel Milling Co.

**Memo 22% Sweet Dairy Feed**

Corn feed meal, cottonseed meal, gluten feed, wheat bran, linseed oil meal, brewers dried grains, ground grain screenings, molasses,  $\frac{1}{2}$  of 1% salt.

Narragansett Milling Co.

**Narragansett Indian Chick Starter**

Yellow corn meal, wheat flour middlings, pure dried buttermilk, beef scraps, fish meal, alfalfa leaf meal, bone meal, fine ground feeding oat meal, charcoal, salt, mineral mixture, cod liver oil.

**Narragansett Indian Egg Mash**

Dried buttermilk, meat and fish scraps, wheat middlings, yellow corn meal, wheat bran, corn gluten feed, ground oats, ground barley, hominy feed, o. p. oil meal, alfalfa leaf meal, salt.

**Narragansett Indian Growing Mash**

Dried buttermilk, meat and fish scraps, wheat middlings, corn feed meal, wheat bran, corn gluten feed, pure oat meal, ground oats, ground barley, hominy feed, o. p. oil meal, alfalfa meal,  $\frac{1}{4}$ % salt.

**New England Dairy Ration**

Corn gluten meal, corn gluten feed, bran, yellow corn meal, o. p. linseed meal, ground oats, cotton seed meal, reground oat feed with molasses, calcium carbonate, salt.

Ontario Milling Co., Inc.

**Aunt Mary's Growing Mash with Dried Buttermilk**

Dried buttermilk, dried skim milk, meat meal, fish meal, oat meal, alfalfa meal, corn feed meal, wheat bran, wheat middlings, steamed bone meal, calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**Aunt Mary's Laying Mash with Dried Buttermilk**

Dried buttermilk, dried skim milk, meat meal, fish meal, steamed bone meal, oat meal, calcium carbonate, old process linseed oil meal, hominy feed or corn feed meal, corn gluten feed, wheat bran, wheat middlings, alfalfa meal, 1% salt. (Wheat feeds may contain ground screenings not to exceed mill run.)

**Big Value 20% Dairy Feed with Molasses**

Cottonseed meal, soya bean oil meal, wheat bran, wheat middlings, cocoanut oil meal, old process linseed oil meal, corn gluten feed, corn gluten meal, hominy feed or corn feed meal, ground oats, molasses, 1% calcium carbonate, 1% salt. (Wheat bran and wheat middlings may contain screenings not to exceed mill run.)

**Butterfat Dairy Feed with Molasses**

Old process linseed oil meal, wheat bran, corn gluten feed, corn gluten meal, hominy feed or corn feed meal, wheat middlings, cottonseed meal, soybean oil meal, cocoanut oil meal, ground barley, ground oats, molasses, 1% calcium carbonate, 1% salt. (Wheat bran and wheat middlings may contain screenings not to exceed mill run.)

**Oswego 20% Dairy Feed with Molasses**

Cottonseed meal, soybean oil meal, wheat bran, wheat middlings, corn gluten feed, hominy feed or corn meal, o. p. linseed oil meal, dried brewers grains, ground wheat screenings, oat meal mill by-products (oat middlings, oat shorts and oat hulls), ground oats, molasses, 1% steamed bone meal, 1% salt, 1% calcium carbonate. (Wheat bran and wheat middlings may contain screenings not to exceed mill run.)

## **Oswego Laying Mash with Dried Buttermilk**

Dried buttermilk, meat meal, fish meal, oat meal, old process linseed oil meal, hominy feed or corn feed meal, corn gluten feed, wheat bran, wheat middlings, wheat flour middlings, ground oats, alfalfa meal, steamed bone meal, calcium carbonate, 1% salt. (Wheat feeds may contain ground screenings not to exceed mill run.)

## **Uncle John's 24% Cream Pot Ration**

Cottonseed meal, soybean oil meal, corn gluten feed, corn gluten meal, old process linseed oil meal, hominy feed or corn feed meal, cocoanut oil meal, wheat bran, wheat middlings, 1% bone meal, and 1% salt. (Wheat bran and wheat middlings may contain screenings not to exceed mill run.)

**Park & Pollard Co.**

## **Bet-R-Milk 20% Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, malt sprouts, wheat bran, wheat middlings may contain mill run of screenings, hominy feed, Iodol fish meal, molasses, calcium carbonate and salt.

## **Growing Feed**

Dried buttermilk, alfalfa leaf meal, Iodol fish meal, linseed oil meal, meat and bone meal, wheat bran and wheat middlings (may contain mill run of screenings), calcium carbonate, salt, ground: corn, wheat, oats, barley.

## **Lay or Bust Dry-Mash**

Dried buttermilk, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soya bean meal, wheat bran and wheat middlings (may contain mill run of screenings), calcium carbonate, salt, ground: corn, wheat, oats, barley, kaffir corn, buckwheat.

## **Milk-Maid 24% Sweetened Dairy Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, distillers dried grains, wheat bran may contain mill run of screenings, brewers dried grains, malt sprouts, corn gluten meal, copra oil meal, corn meal, Iodol fish meal, molasses, calcium carbonate and salt.

## **Overall 24% Dairy Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, distillers dried grains, wheat bran, wheat middlings may contain mill run of screenings, corn gluten meal, hominy feed, calcium carbonate and salt.

## **Park & Pollard Chick Starter**

Dried buttermilk, vitamin tested cod liver oil, ground: corn, wheat, barley, oat meal, Iodol fish meal, meat and bone meal, wheat bran, wheat middlings, alfalfa leaf meal, rice, calcium carbonate and salt.

**Postum Co., Inc.**

## **Burt's Dairy Feed**

Cereal and Postum by-products: (corn, wheat, wheat bran, wheat middlings, wheat flour, barley malt flour, barley malt hulls, may contain trace of screenings), hominy feed, gluten meal, old process oil meal, choice cottonseed meal, calcium carbonate and salt.

**Pratt Food Co., Inc.**

## **Pratts All-Mash Chick Starter with Buttermilk**

Dried buttermilk, alfalfa leaf meal, oat meal, meat scrap, corn meal, wheat bran and wheat middlings, (may contain mill-run ground screenings), bone meal, calcium carbonate  $1\frac{1}{4}\%$ , calcium phosphate  $\frac{1}{2}$  of 1%, iodized salt 1%.

## **Pratts Baby Chick Food with Buttermilk**

Dried buttermilk, alfalfa leaf meal, oat meal, cooked wheat, ground wheat, meat scrap, corn meal, wheat middlings (may contain mill-run ground screenings), rape, millet, Epsom salts, bone meal, calcium carbonate  $1\frac{3}{4}\%$ , calcium phosphate  $\frac{3}{4}$  of 1%.

## **Pratts B-P Dairy Feed**

Beet pulp, o. p. linseed oil meal, hominy feed, cottonseed meal, corn meal, wheat bran (may contain mill-run ground screenings), corn gluten feed, oat meal, molasses, calcium carbonate  $\frac{3}{4}$  of 1%, calcium phosphate  $\frac{1}{4}$  of 1%, iodized salt 1%.

## **Pratts Cak-Cak Egg Mash with Buttermilk, Fish, Meat, Etc.**

Dried buttermilk, pulverized oats, o. p. linseed oil meal, meat scrap, fish meal, corn meal, alfalfa meal, yellow hominy feed, wheat bran and wheat middlings (may contain mill-run ground screenings), bone meal, calcium carbonate  $\frac{3}{4}$  of 1%, calcium phosphate  $\frac{1}{4}$  of 1%, iodized salt  $\frac{1}{2}$  of 1%.

## **Pratts Laying Mash with Buttermilk**

Dried buttermilk, oat meal, wheat germ meal, meat scrap, fish meal, corn meal, ground barley, o. p. linseed oil meal, alfalfa meal, wheat bran and wheat middlings (may contain mill-run ground screenings), calcium carbonate  $1\frac{1}{4}\%$ , calcium phosphate  $\frac{1}{2}$  of 1%, iodized salt  $\frac{1}{2}$  of 1%.

**H. C. Puffer Co.**

## **Egg-Em-On Laying Mash**

Dried milk, dried fish, meat scraps, wheat bran and wheat middlings (not exceeding mill run of screenings), corn feed meal, corn gluten feed, ground oats, linseed meal, alfalfa meal, small percentage salt and calcium carbonate.

**Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, corn gluten meal, ground oats, corn feed meal, wheat bran and wheat middlings (not exceeding mill run of screenings), small percentage salt and calcium carbonate.

**Sweetened Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, corn gluten meal, corn feed meal, wheat bran and wheat middlings (not exceeding mill run of screenings), oat feed, molasses, small percentage salt and calcium carbonate.

**Quaker Oats Co.****Quaker Ful-O-Pep Chick Starter**

Oatmeal, hominy feed, yellow hominy feed, wheat bran, wheat middlings, fish meal, cod liver meal, cod liver oil, dried skimmed milk, dried buttermilk, molasses, alfalfa, 2% steamed bone meal,  $\frac{3}{4}$  of 1% salt.

**Quaker Ful-O-Pep Egg Mash**

Oatmeal, hominy feed, yellow hominy feed, wheat bran, wheat middlings, barley meal, fish meal, cod liver meal, meat scraps, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Quaker 24% Protein Dairy Ration**

Hominy feed, yellow hominy feed, cottonseed meal, corn gluten feed, linseed meal, wheat bran, wheat middlings, oatmeal mill by-product (oat middlings, oat shorts, oat hulls),  $\frac{3}{4}$  of 1% salt, 1% ground limestone, molasses.

**Quaker 20% Protein Dairy Ration**

Hominy feed, yellow hominy feed, barley meal, cottonseed meal, corn gluten feed, linseed meal, wheat bran, wheat middlings, oatmeal mill by-product (oat middlings, oat shorts, oat hulls),  $\frac{3}{4}$  of 1% salt, 1% ground limestone, molasses.

**Ralston Purina Co.****Protina 20% Dairy Feed**

Cottonseed meal, corn gluten feed, brewers dried grains, wheat middlings (standard), wheat bran, molasses, 1% iodized salt.

**Purina All Mash Startena Chow**

Dried buttermilk, cod liver oil, meat scrap, alfalfa leaf meal, wheat germ, linseed meal, corn germ meal, oat middlings, corn meal, wheat bran, grey wheat middlings,  $\frac{1}{2}$ % calcium carbonate (limestone),  $\frac{1}{2}$ % iodized salt.

**Purina Breeder Egg Chowder**

Dried buttermilk, cod liver oil, alfalfa leaf meal, meat scrap, soy bean oil meal, linseed meal, corn germ meal, wheat middlings, wheat bran, corn meal, alfalfa meal, 1% iodized salt, 3% calcium carbonate (limestone).

**Purina 34% Cow Chow**

Linseed meal, soy bean oil meal, corn gluten meal, cottonseed meal, alfalfa meal, molasses, 1% iodized salt.

**Purina 24% Cow Chow**

Linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, wheat middlings (standard), wheat bran, alfalfa meal, molasses, 1% iodized salt.

**Purina 20% Cow Chow**

Dried beet pulp, linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, wheat middlings (standard), wheat bran, corn meal, alfalfa meal, molasses, 1% iodized salt.

**Purina Egg Chowder**

Meat scrap, soy bean oil meal, linseed meal, alfalfa leaf meal, corn germ meal, wheat middlings, wheat bran, corn meal, alfalfa meal, 1% iodized salt, 3% calcium carbonate (limestone).

**Purina Lay Chow**

Soy bean oil meal, meat scrap, molasses, alfalfa meal, corn meal, wheat middlings, wheat bran, 1% iodized salt, 4% calcium carbonate (limestone).

**Ryther & Warren****Blue Tag Dairy Ration**

41% Cottonseed meal, o. p. oil meal, gluten feed, hominy, wheat bran, wheat middlings, ground oats, dried beet pulp and salt and calcium carbonate.

**Minot Milk Egg Mash**

Yellow corn meal, wheat bran, flour middlings, ground 40 lb. oats, meat scraps 50% pro., fish meal 55% pro., alfalfa leaf meal, steamed bone meal, dried milk, salt.

**Minot Poultry Mash**

Wheat bran, wheat middlings, red dog, corn meal, gluten feed, alfalfa meal, ground oats, oat flour, fish and meat scraps and one half of one per cent of salt.

## St. Albans Grain Co.

### Hygrade 24 Sweetened Milk Ration

Corn gluten meal, corn gluten feed, old process linseed meal, cottonseed meal, brewers' dried grains, corn meal, ground oats, ground barley, wheat bran, wheat middlings, steamed bone meal, calcium carbonate, dairy salt and pure cane molasses.

### Hygrade 20 Sweetened Milk Ration

Old process linseed meal, cottonseed meal, brewers' dried grains, corn gluten meal, corn gluten feed, corn meal, ground oats, ground barley, wheat bran, wheat middlings, pure cane molasses, steamed bone meal, calcium carbonate and dairy salt.

### Hygrade 16 Sweetened Milk Ration

Old process linseed meal, cottonseed meal, brewers' dried grains, corn gluten meal, corn gluten feed, corn meal, ground oats, ground barley, wheat bran, wheat middlings, pure cane molasses, steamed bone meal, calcium carbonate and dairy salt.

### Utility Dairy Ration

Old process linseed meal, corn gluten feed, cottonseed meal, corn meal, ground oats, ground barley, brewers' dried grains, oat meal mill by-products (oat middlings, oat shorts, oat hulls), wheat bran, wheat middlings, steamed bone meal, calcium carbonate, pure cane molasses and dairy salt.

### Wirthmore Baby Chick Starter containing Cod Liver Meal, Buttermilk, Cod Liver Oil

Cod liver oil, cod liver meal, pure dried buttermilk, dried skim milk, alfalfa leaf meal, fish meal, fine ground beef scraps, edible bone meal, pure wheat bran, pure wheat middlings, ground hulled oats, ground wheat, yellow corn meal, corn germ meal, calcium carbonate and salt.

### Wirthmore 25 Balanced Ration Sweetened

Corn gluten meal, corn distillers' dried grains, old process linseed meal, brewers' dried grains, pure ground oats, cottonseed meal, corn gluten feed, yellow corn meal, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

### Wirthmore Breeder Mash

Cod liver oil, dried buttermilk, dried skim milk, meat scraps, fish meal, yellow corn meal, corn germ meal, alfalfa leaf meal, linseed oil meal, corn gluten meal, wheat bran, wheat middlings, pulverized oats and barley, calcium carbonate and salt.

### Wirthmore 20 Dairy Feed

Corn gluten meal, corn distillers' dried grains, old process linseed meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, pure ground oats, wheat middlings, wheat bran, edible bone meal and dairy salt.

### Wirthmore 20 Dairy Feed Sweetened

Corn gluten meal, corn distillers' dried grains, old process linseed meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, pure ground oats, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

### Wirthmore Dairy Feed with Beet Pulp Sweetened

Dried beet pulp, cottonseed meal, old process linseed meal, wheat bran, wheat middlings, corn gluten feed, yellow corn meal, pure ground oats, edible bone meal, pure cane molasses and dairy salt.

### Wirthmore 16 Dairy Ration Sweetened

Corn gluten meal, corn distillers' dried grains, corn gluten feed, old process linseed meal, brewers' dried grains, yellow corn meal, pure ground oats, wheat bran, wheat middlings, cottonseed meal, edible bone meal, pure cane molasses and dairy salt.

### Wirthmore Growing Mash containing Buttermilk

Pure dried buttermilk, dried skim milk, choice beef scraps, fish meal, edible bone meal, yellow corn meal, alfalfa leaf meal, old process linseed meal, ground wheat, oats, barley, milo maize, wheat bran, wheat middlings, wheat red dog flour, calcium carbonate and salt.

### Wirthmore Laying Mash with Buttermilk

Pure dried buttermilk, dried skim milk, choice beef scraps, fish meal, yellow corn meal, alfalfa leaf meal, linseed meal, corn gluten feed, wheat bran, wheat middlings, ground rolled oats, oats, barley, buckwheat, milo maize, calcium carbonate and salt.

### Wirthmore Turkey Growing Feed

Cod liver oil, pure dried buttermilk, dried skim milk, fine ground beef scraps, fish meal, edible bone meal, yellow corn meal, corn germ meal, wheat bran, wheat middlings, wheat red dog flour, ground oats, ground barley, cracked wheat, alfalfa leaf meal, calcium carbonate and salt.

C. H. Symmes

### The Ideal Dairy Ration

Wheat middlings, wheat bran, brewers grains, cottonseed meal, linseed meal, gluten meal, gluten feed, corn meal or hominy, molasses, salt, bone meal, calcium carbonate, ground barley.

## Syracuse Milling Co.

**Syracuse Dairy Feed**

Corn meal, ground oats, wheat bran and wheat middlings with mill run screenings, toasted wheat feed (wheat and wheat bran processed), corn gluten feed, linseed meal, cottonseed meal, soy bean oil meal, distillers' dried grains, brewers' dried grains, calcium carbonate and salt.

**Syracuse Egg Mash**

Ground corn, ground barley, wheat flour, wheat middlings and bran with mill run screenings, alfalfa meal, ground meat and bone, fish and salt.

**Syracuse Growing Mash**

Wheat flour, wheat middlings with mill run screenings, ground barley, ground corn, alfalfa meal, dried buttermilk, fish meal, ground meat and bone, calcium carbonate and salt.

## Tioga-Empire Feed Mills, Inc.

**Egatine**

Wheat middlings, corn meal, corn gluten meal, wheat bran, meat and bone scrap, pulverized oats, fish meal, soy bean oil meal, phosphate of lime, dried skim milk. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**E-Gee Dairy Feed**

Wheat bran, cottonseed meal, corn gluten feed, soy bean oil meal, hominy feed, wheat middlings, cane molasses, salt, phosphate of lime, charcoal, iodine, malt sprouts. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**Red Brand Ti-O-Ga Dairy Feed**

Cottonseed meal, soy bean oil meal, coconut oil meal, wheat bran, wheat middlings, cane molasses, hominy feed, peanut oil meal, corn gluten feed, salt, phosphate of lime, charcoal, iodine. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**Ti-O-Ga Chick and Growing Mash**

Corn meal, wheat middlings, wheat bran, soy bean oil meal, powdered buttermilk, phosphate of lime, fish meal, meat & bone scrap, pulverized oats, corn gluten meal, linseed oil meal, ground wheat. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**Ti-O-Ga Laying Food**

Wheat middlings, corn meal, wheat bran, pulverized oats, fish meal, soy bean oil meal, corn gluten meal, meat and bone scrap, dried skim milk, phosphate of lime, linseed oil meal, ground wheat. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

## United Co-Operative Farmers, Inc.

**United Farmers Milk Egg Mash**

No. 2 yellow corn meal—attrition, standard wheat bran, wheat flour middlings, pure gr. oats (No. 2—38 lb. clpd-unsul.), meat scraps 50%, pure fish meal 55%, alfalfa leaf meal, pure dried buttermilk, steamed bone meal, salt.

**United Farmers Milkmaker**

Choice yel. hominy, pure gr. oats (No. 2—38 cl-un), stand. wheat bran, choice cottonseed meal, old pro. linseed oil meal, corn gluten feed, soy bean oil meal, molasses, corn dist. dried grains, steamed bone meal, calcium carbonate, salt.

**United Farmers Milk Pep**

Choice cottonseed meal, old pro. linseed meal, choice yellow hominy, corn gluten feed, pure gr. oats (No. 2—38 cl-un), soy bean oil meal, stand. wheat bran, corn dist. dried grains, molasses, steamed bone meal, calcium carbonate, salt.

## C. P. Washburn Co.

**"Made Right" Balanced Ration**

Cottonseed meal, linseed oil meal, corn gluten, wheat bran, corn meal, oat feed, beet pulp, charcoal, calcium carbonate, salt, bone meal, ground oats, soy bean meal, brewers' grains.

**"Made Right" Dry Mash**

Corn meal, wheat bran, wheat middlings, red dog, 2nd clear flour, gr. oatmeal, linseed oil meal, gluten feed, soy bean meal, ground wheat, meat scraps, fish meal, dr. skim milk, alfalfa leaf meal, molasses, charcoal, calcium carbonate, salt, cod liver oil.

**"Made Right" Molasses Dairy Feed**

Corn meal, wheat meal, ground oats, cottonseed meal, linseed oil meal, wheat bran, soy bean meal, gluten, molasses, bone meal, calcium carbonate, salt, brewers' grains.

**"Made Right" Starting and Growing Feed**

Corn meal, wheat bran, wheat middlings, oat meal, gluten meal, red dog, 2nd clear flour, meat scraps, wheat, soy bean meal, fish meal, dr. skim milk, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, & cod liver oil.

H. K. Webster Co.

## Blue Seal Breeders' Mash

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground heavy oats, ground rolled oats, ground barley, corn gluten meal, 50% meat scraps, dried skim milk, 55% codfish meal, alfalfa leaf meal, salt, calcium carbonate, cod liver meal blend and oil.

## Blue Seal "21" Dairy Ration

Hominy feed, choice cottonseed meal, wheat bran, malt sprouts, peanut middlings, P. R. cane molasses, gluten meal, o. p. oil meal, ground oats, "Oregon" mineral mixture.

## Blue Seal "20" Dairy Ration

Gluten feed, hominy feed, o. p. oil meal, ground oats, wheat bran, choice cottonseed meal, wheat middlings, P. R. cane molasses, edible bone meal, calcium carbonate, salt.

## Blue Seal Improved All-Mash Ration

Ground whole corn, ground wheat, ground poultry oats, bran, middlings, h. g. meat scraps, dried skim milk, alfalfa leaf meal, P. R. cane molasses, salt, cod liver meal blend, steamed bone meal.

## Blue Seal Improved Balanced Ration

Choice cottonseed meal, hominy feed, malt sprouts, gluten meal, wheat bran, P. R. cane molasses, peanut middlings, o. p. oil meal, ground oats, corn distillers grains, "Oregon" mineral mixture.

## Blue Seal "Lo-Cost" Dairy Ration

Choice cottonseed meal, hominy feed, malt sprouts, gluten meal, wheat bran, wheat middlings, P. R. cane molasses, peanut middlings, ground barley, calcium carbonate, salt.

## Blue Seal Milk Mash

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, fine ground heavy oats, 50% meat scraps, dried skim milk, 55% fish meal, alfalfa leaf meal, salt, cod liver oil, cod liver meal blend.

## Blue Seal Starting Ration

Coarse ground No. 2 yellow corn, ground fancy wheat, fine ground heavy oats, ground rolled oats, ground barley, pure wheat bran, wheat flour middlings, high grade meat scraps, dried skim milk, alfalfa meal, calcium carbonate, salt, cod liver oil, cod liver meal blend.

## Blue Seal University Laying Mash

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, fine ground heavy oats, 50% meat scraps, 55% fish meal, alfalfa leaf meal, salt, cod liver meal blend.

West-Nesbitt, Inc.

## All Pure 20% Milk Ration

Choice cottonseed meal, corn gluten meal, old process linseed oil meal, corn gluten feed, wheat bran, wheat middlings, hominy feed or corn meal, pure cane molasses, 1% steamed bone meal, 1% calcium carbonate, ½ of 1% salt.

## Pure Feed Dairy Ration

Corn gluten feed, wheat middlings, wheat bran, beet pulp, hominy or corn meal, choice cottonseed meal, old process linseed oil meal, 1% steamed bone meal, 1% calcium carbonate, ½ of 1% salt.

## Pure Sweetfeed Dairy Ration

Corn gluten feed, soya bean meal, wheat middlings, wheat bran, hominy or corn meal, choice cottonseed meal, old process linseed oil meal, pure cane molasses, 1% steamed bone meal, 1% calcium carbonate, ½ of 1% salt.

## Pure Feed Eggmaker

Dried skim milk, bone and meat meal, old process linseed oil meal, corn gluten feed, wheat middlings, wheat flour middlings, hominy or corn meal, steamed bone meal, 1% calcium carbonate, 1% salt.

## Super Pure Sweetfeed Dairy Ration

Corn gluten feed, soya bean meal, choice cottonseed meal, old process linseed oil meal, dried yeast grains, wheat bran, wheat middlings, hominy or corn meal, pure cane molasses, 1% steamed bone meal, 1% calcium carbonate, ½ of 1% salt.

## Uniform Sweet Dairy Ration

Choice cottonseed meal, corn gluten feed, hominy feed or corn meal, wheat bran, oat middlings, oat shorts, oat hulls, pure cane molasses, 1% calcium carbonate, 1% salt.

Estate of M. G. Williams

## Williams' Balanced Ration

Corn meal, or hominy or wheat meal, linseed meal, cottonseed meal, ground oats, gluten feed, wheat feed, bone meal and 1% salt.

## Williams' Chick Starter and Broiler Ration

Corn meal, cut oat groats, beef scraps, middlings, bran, alfalfa leaf meal, dried skim milk, linseed meal, bone meal, lime, granulated charcoal and fine salt.



**Williams' Dry Mash**

Wheat bran, middlings, corn meal or wheat meal, ground oats, beef scraps, linseed meal, gluten feed, lime and fine salt.

**Williams' Growing Feed**

Corn meal or wheat meal, oatmeal, beef scraps, middlings, bran, second clear, alfalfa leaf meal, bone meal, linseed meal, granulated charcoal and fine salt and calcium carbonate.

Stanley Wood Grain Co.

**Bliss Dairy Ration**

Meal (or hominy), cottonseed meal, wheat bran, linseed, wheat middlings, gluten meal, gluten feed, table salt, edible bone meal, calcium carbonate. (Beet pulp.)

**Preferred Laying Mash.**

Pure dried skim milk, dried fish meal, alfalfa leaf meal, beef scraps, yellow corn meal, wheat bran, pulverized oats, wheat middlings, edible bone meal, table salt, calcium carbonate.

**Preferred Starting and Growing Mash**

Pure dried skim milk, dried fish meal, yellow corn meal, wheat bran, wheat middlings, fine ground oatmeal, alfalfa leaf meal, beef scraps, edible bone meal, table salt, calcium carbonate.

**Woods Dairy Ration**

Wheat middlings, malt sprouts, linseed, meal (or hominy), wheat bran, cottonseed meal, oat feed, gluten feed, molasses, salt, edible bone meal, calcium carbonate.

### Microscopic Examination

During the past year particular attention has been paid to those feeds which experience has shown might be adulterated, or not in accordance with the guarantee of ingredients. Substitution appears to be practiced to a greater extent by local mixers and small manufacturers, not always, however, with the intent to defraud, but on account of the difficulty sometimes experienced in obtaining the ingredients guaranteed.

In one instance it was found that a manufacturer who held the contract from a cooperative was substituting brewers grains for distillers grains in the dairy mixtures, and also using a cooked cereal residue in place of wheat bran. While the feeding value of the feeds was not materially reduced, cheaper products were being substituted for more valuable ones, a cash saving which should have reverted to the consumer rather than to the benefit of the manufacturer. After receiving a cash settlement, the cooperative severed its relations with this manufacturer and placed its contract elsewhere.

In several instances this same manufacturer was found to have substituted a cooked cereal residue for wheat bran in his own line of feeds.

One dealer was found to have substituted an oat residue, wholly or in part, for ground oats in a poultry mash mixed to customer's order.

Feedstuffs on the whole appeared to be true to their ingredient guarantees.



## Average Analyses and Retail Prices of Unmixed By-Products.

FEEDSTUFFS.	Year. <sup>1</sup>	Number of Sam- ples.	Water (Per Cent).	Pro- tein (Per Cent).	Fat (Per Cent).	Nitro- gen Free Ex- tract (Per Cent).	Fiber (Per Cent).	Ash (Per Cent).	Price Per Ton.
Cottonseed Meal . . .	1929	72	7.0	38.5	6.8	30.2	11.1	6.4	\$57 84
Cottonseed Meal . . .	1930	83	7.4	39.2	6.9	29.7	10.6	6.2	51 25
Cottonseed Meal . . .	1931	85	6.7	39.4	6.5	31.0	10.8	5.6	44 95
Cottonseed Meal . . .	1932	64	7.2	40.9	6.6	28.9	10.0	6.4	31 00
Linseed Meal . . . . .	1929	33	8.6	34.3	6.0	37.4	8.2	5.5	66 68
Linseed Meal . . . . .	1930	44	8.0	34.6	6.8	37.3	7.8	5.5	65 36
Linseed Meal . . . . .	1931	29	8.0	36.0	6.4	37.1	7.5	5.0	52 12
Linseed Meal . . . . .	1932	34	8.7	38.2	6.1	34.8	7.1	5.1	40 68
Gluten Meal . . . . .	1929	15	9.0	40.8	3.3	42.5	3.1	1.4	64 79
Gluten Meal . . . . .	1930	20	8.7	41.7	1.9	42.6	2.6	2.5	60 90
Gluten Meal . . . . .	1931	22	8.1	42.6	1.9	43.4	2.4	1.6	50 90
Gluten Meal . . . . .	1932	24	8.5	44.5	1.8	41.3	2.0	1.9	31 95
Gluten Feed . . . . .	1929	48	8.9	26.8	2.2	48.5	7.4	6.2	54 05
Gluten Feed . . . . .	1930	51	9.7	25.7	2.3	49.1	7.1	6.1	49 91
Gluten Feed . . . . .	1931	50	9.3	25.7	2.5	49.1	7.3	6.1	43 90
Gluten Feed . . . . .	1932	53	9.9	27.4	2.4	47.9	6.7	5.7	28 35
Wheat Standard Middlings	1929	42	9.6	16.3	5.8	56.4	7.6	4.3	43 78
Wheat Standard Middlings	1930	37	10.2	17.2	5.6	55.0	7.7	4.3	43 94
Wheat Standard Middlings	1931	40	9.4	17.7	5.3	56.0	7.5	4.1	33 76
Wheat Standard Middlings	1932	28	9.8	18.5	5.5	54.6	7.1	4.5	25 13
Wheat Flour Middlings .	1929	21	10.4	16.5	5.2	59.2	5.1	3.6	49 74
Wheat Flour Middlings .	1930	17	10.2	16.7	4.9	59.8	5.0	3.4	46 64
Wheat Flour Middlings .	1931	11	9.5	17.1	4.6	60.1	5.3	3.4	39 27
Wheat Flour Middlings .	1932	20	10.2	18.3	4.8	58.2	4.9	3.6	27 65
Red Dog Flour . . . . .	1929	15	10.6	16.7	4.7	62.5	2.6	2.9	55 64
Red Dog Flour . . . . .	1930	15	10.9	16.5	4.1	63.5	2.3	2.7	52 38
Red Dog Flour . . . . .	1931	14	10.2	16.5	3.8	65.8	1.7	2.0	40 00
Red Dog Flour . . . . .	1932	7	10.2	18.8	4.4	61.3	2.4	2.9	29 83
Wheat Mixed Feed . . .	1929	75	9.7	16.1	5.2	57.0	7.3	4.7	48 06
Wheat Mixed Feed . . .	1930	55	10.3	16.8	5.0	56.3	7.0	4.6	45 08
Wheat Mixed Feed . . .	1931	54	9.4	17.1	4.9	57.3	6.9	4.4	36 53
Wheat Mixed Feed . . .	1932	60	10.1	17.4	4.6	57.0	6.3	4.6	27 58
Wheat Bran . . . . .	1929	88	9.6	15.1	5.4	53.3	10.7	5.9	42 74
Wheat Bran . . . . .	1930	72	9.9	16.0	5.0	53.1	10.1	5.9	42 48
Wheat Bran . . . . .	1931	84	9.2	16.6	4.9	53.9	9.8	5.6	32 77
Wheat Bran . . . . .	1932	71	9.9	17.2	5.0	52.7	9.4	5.8	23 49
Rye Feed . . . . .	1929	4	9.8	15.6	3.3	62.9	4.9	3.5	39 50
Rye Feed . . . . .	1930	3	9.9	16.5	3.7	61.2	5.0	3.7	36 00
Rye Feed . . . . .	1931	3	9.0	16.9	3.3	63.0	4.8	3.0	32 50
Rye Feed . . . . .	1932	5	9.3	17.5	3.4	61.8	4.8	3.2	19 00
Corn Meal . . . . .	1929	40	12.5	8.8	4.3	70.6	2.3	1.5	47 91
Corn Meal . . . . .	1930	58	12.8	8.8	4.2	70.8	2.0	1.4	47 42
Corn Meal . . . . .	1931	38	11.2	9.4	4.0	71.9	2.0	1.5	43 65
Corn Meal . . . . .	1932	33	12.1	9.9	4.3	70.4	1.9	1.4	27 25
Ground Oats . . . . .	1929	66	9.6	11.5	4.9	60.6	10.2	3.2	47 20
Ground Oats . . . . .	1930	78	9.8	11.1	4.4	61.9	9.7	3.1	47 63
Ground Oats . . . . .	1931	64	8.9	11.8	4.3	61.9	9.9	3.2	40 77
Ground Oats . . . . .	1932	59	9.4	13.2	4.4	60.1	9.6	3.3	31 28
Hominy Feed . . . . .	1929	50	9.4	10.5	6.4	66.6	4.5	2.6	48 58
Hominy Feed . . . . .	1930	52	9.5	10.3	6.7	66.6	4.4	2.5	48 16
Hominy Feed . . . . .	1931	32	9.5	10.7	6.7	66.6	4.2	2.3	40 46
Hominy Feed . . . . .	1932	39	9.2	11.6	7.3	65.1	4.1	2.7	26 81
Dried Beet Pulp . . . .	1929	18	8.3	8.9	0.8	59.3	19.1	3.6	55 38
Dried Beet Pulp . . . .	1930	21	8.2	9.2	0.7	60.6	17.6	3.7	52 25
Dried Beet Pulp . . . .	1931	21	7.9	8.9	0.7	66.1	18.1	3.3	38 15
Dried Beet Pulp . . . .	1932	10	9.2	9.3	0.7	59.0	19.3	2.5	30 22
Oat Feed . . . . .	1929	4	6.1	5.4	2.8	51.6	28.8	5.3	21 50
Oat Feed . . . . .	1930	—	—	—	—	—	—	—	—
Oat Feed . . . . .	1931	4	6.0	4.6	1.7	51.0	30.2	6.5	24 00
Oat Feed . . . . .	1932	2	6.7	6.9	2.4	50.9	27.4	5.7	15 00

<sup>1</sup> From September 1 to April 30 of each year.

## Directory of Manufacturers Who Registered Feeding Stuffs for Sale in the State in 1932

- Acme-Evans Co., Indianapolis, Ind.  
 Allied Mills, Inc., Chicago, Ill. (Registered also for Soya Products, Inc.)  
 American Maize-Products Co., 100 East 42nd St., New York, N. Y.  
 A. P. Ames Co., 10 Walnut St., Peabody, Mass.  
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.  
 Archer-Daniels-Midland Co., Minneapolis, Minn.  
 Ashcraft-Wilkinson Co., Atlanta, Ga.  
 Associated Farmers' Exchanges, Inc., 278 Main St., Greenfield, Mass.  
 E. W. Bailey & Co., Montpelier, Vt.  
 G. N. Bartemus Co., Concord, N. H.  
 Beacon Milling Co., Inc., Cayuga, N. Y.  
 Berkshire Coal & Grain Co. Inc., North Adams, Mass.  
 Bisbee Linseed Co., Bankers' Trust Bldg., Philadelphia, Penn.  
 Black Rock Milling Corp., 356 Hertel Ave., Buffalo, N. Y.  
 Blish Milling Co., Seymour, Ind.  
 Bolduc & Sons, New Bedford, Mass.  
 Borden Grain Co., Taunton, Mass.  
 Borden Sales Co., Inc., 350 Madison Ave., New York, N. Y.  
 C. W. Brister & Son, Auburn, N. Y.  
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Company of North America.)  
 Geo. B. Brown, Ipswich, Mass.  
 Buckeye Cotton Oil Co., Cincinnati, Ohio.  
 C. E. Buell, Inc., 131 State St., Boston, Mass.  
 C. W. Burckhalter, Inc., 119 Broad St., New York, N. Y.  
 Butchers Rendering Co., Fall River, Mass.  
 Butman Grain & Feed Co., Lynn, Mass.  
 Cairo Meal and Cake Co., Cairo, Ill.  
 Caledonia Mills, Inc., St. Johnsbury, Vt.  
 Canada Linseed Oil Mills, Ltd., Montreal, Que., Canada.  
 Cannon Valley Milling Co., Minneapolis, Minn.  
 A. B. Caple Co., Sta. A, Box 27, Toledo, Ohio.  
 Center Milk Products Co., Middlebury Center, Penn.  
 Chapin & Co., Hammond, Ind.  
 Clinton Corn Syrup Refining Co., Clinton, Iowa.  
 Coles Co., Middletown, Conn.  
 Collis Products Co., 201 Custer St., St. Paul, Minn.  
 Commander-Larabee Corp., Minneapolis, Minn.  
 Community Feed Stores, Inc., East Longmeadow, Mass.  
 G. E. Conkey Co., Cleveland, Ohio.  
 Consolidated Feed & Grain Co., Inc., 912-916 Chamber of Commerce, Buffalo, N. Y.  
 Consolidated Rendering Co., Boston, Mass.  
 Consumers Import Co., Inc., 115 Broad St., New York, N. Y.  
 Copeland Flour Mills, Ltd., Midland, Ont., Canada.  
 Corn Products Refining Co., 17 Battery Place, New York, N. Y.  
 Nicolas Courcy, 11 Waverly St., Taunton, Mass.  
 Cover & Palm Co., 150 Middle St., Lowell, Mass.  
 E. A. Cowee Co., Fitchburg, Mass.  
 Chas. M. Cox Co., Boston, Mass. (Registered for Lake-of-the-Woods Milling Co., Ltd., Sherwin-Williams Co. of Canada, Ltd., and Western Canada Four Mills, Ltd.)  
 Crosby Milling Co., Brattleboro, Vt.  
 Curley Brothers, Wakefield, Mass.  
 J. Cushing Co., Fitchburg, Mass.  
 Cutler Co., North Wilbraham, Mass. (Registered by St. Albans Grain Co.)  
 Dairymen's League Co-Operative Association, Inc., 11 West 42nd St., New York, N. Y.  
 Decatur Milling Co., Inc., Decatur, Ill.  
 Dehydrating Process Co., 60 Mt. Washington Ave., Boston, Mass.  
 Delaware Mills, Inc., Deposit, N. Y.  
 Denver Alfalfa Milling & Products Co., Lamar, Col.  
 Dewey Bros. Co., Blanchester, Ohio.  
 Frank Diauto, Randolph, Mass.  
 F. Diehl & Son, Inc., Wellesley, Mass.  
 Dietrich & Gambrill, Inc., Frederick, Md.  
 Dixie Mills Co., East St. Louis, Ill.  
 Donahue Stratton Co., 414 Mitchell Bldg., Milwaukee, Wis.  
 John C. Dow Co., Inc., 200 Broadway, Cambridge, Mass.  
 Dreyer Commission Co., 300 Merchants Exchange Bldg., St. Louis, Mo.  
 Dry Milk Co., Inc., 205 East 42nd St., New York, N. Y.  
 Duluth-Superior Milling Co., Duluth, Minn.  
 Eagle Roller Mill Co., New Ulm, Minn.  
 East Bridgewater Farmers Cooperative Exchange, Inc., East Bridgewater, Mass.  
 Eastern Grain Co., Bridgewater, Mass.  
 Eastern States Farmers' Exchange, Springfield, Mass.  
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago, Ill.  
 Eddy Milling & Drying Co., Pennsboro, Fla.  
 Michael W. Ellis, 19 Walnut St., Peabody, Mass.  
 Elm City Creamery, Inc., 3 Pleasant St., Fairhaven, Mass.  
 Elmore Milling Co., Inc., Oneonta, N. Y.  
 John W. Eshelman & Sons, Lancaster, Penn.  
 Evans Milling Co., Indianapolis, Ind.  
 Everett, Aughenbaugh & Co., Minneapolis, Minn.

Fairmont Creamery Co., Omaha, Neb.  
 Farmers Feed Co., 532 East 76th St., New York, N. Y.  
 Federal Mill, Inc., Lockport, N. Y.  
 Fernando Valley Milling & Supply Co., 336 I. W. Hellman Bldg., Los Angeles, Cal.  
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.  
 Flory Milling Co., Inc., Bangor, Penn.  
 J. A. Forrest, 817-819 Security Bldg., Minneapolis, Minn.  
 Fort Schuyler Farms, Inc., 49 Franklin Sq., Utica, N. Y.  
 Fred A. Fountain, 355 Tremont St., Taunton, Mass.  
 Dean S. French, West Stoughton, Mass.  
 J. B. Garland & Son., Worcester, Mass.  
 General Mills, Inc., Minneapolis, Minn.  
 W. K. Gilmore & Sons, Inc., Walpole, Mass.  
 Gilster Milling Co., Chester, Ill.  
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.  
 D. H. Grandin Milling Co., Jamestown, N. Y.  
 Great Atlantic & Pacific Tea Co., New York, N. Y.  
 Hales & Hunter Co., 327 South LaSalle St., Chicago, Ill.  
 Frank B. Ham & Co., Ltd., 1506 Royal Bank Bldg., Toronto 2, Ont., Canada.  
 William Hamilton & Son, Inc., Honeoye Falls, N. Y.  
 D. Harbeck, 405 Earle St., New Bedford, Mass.  
 Hecker-H-O Co., Inc., Buffalo, N. Y.  
 Hecker-Jones-Jewell Milling Co., 503 Seneca St., Buffalo, N. Y.  
 Hershey Creamery Co., Harrisburg, Penn.  
 W. D. Higgins Co., Framingham, Mass.  
 Hincley Rendering Co., Somerville, Mass.  
 Hirst & Begley Linseed Works, 2013 Mendel St., Chicago, Ill.  
 D. B. Hodgkins' Sons, Manchester, Mass.  
 Horvitz Grain Co., 742 Acushnet Ave., New Bedford, Mass.  
 R. B. Howlett, Amherst, Mass.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 Igleheart Brothers, Inc., Evansville, Ind.  
 J. F. Imbs Milling Co., Belleville, Ill.  
 International Milling Co., Minneapolis, Minn.  
 International Vegetable Oil Co., Inc., Savannah, Ga.  
 Henry James & Son, Inc., Springfield, Mass.  
 Jaquith & Co., Woburn, Mass.  
 Jersee Co., Minneapolis, Minn.  
 Joslin-Schmidt Corp., Cincinnati, Ohio.  
 Kansas Flour Mills Corp., Kansas City, Mo.  
 Kellogg Co., Battle Creek, Mich.  
 Kelloggs & Miller, Inc., Amsterdam, N. Y.  
 Spencer Kellogg & Sons, Inc., Buffalo, N. Y.  
 Kerr Chickeries Inc., Frenchtown, N. J.  
 H. H. King Flour Mills Co., Minneapolis, Minn.  
 Lake-of-the-Woods Milling Co., Ltd., Montreal, Que., Canada. (Registered by Chas. M. Cox Co.)  
 Land O'Lakes Creameries, Inc., Minneapolis, Minn.  
 Larabee Flour Mills Co., Kansas City, Mo.  
 Larowe Milling Co., Box 68, North End Sta., Detroit, Mich.  
 Lawrenceburg Roller Mills Co., Lawrenceburg, Ind.  
 Lincoln Farm Products Corp., 407 East 31st St., New York, N. Y.  
 L. B. Lovitt & Co., Memphis, Tenn.  
 Lowell Rendering Co., North Billerica, Mass.  
 Maine Fish Meal Co., Portland, Maine.  
 Mann Bros. Co., Buffalo, N. Y.  
 Mansfield Milling Co., P. O. Box 54, Mansfield, Mass.  
 Maple Leaf Milling Co., Ltd., Toronto, Ont., Canada. (Registered by Traders Feed & Grain Co., Inc.)  
 Marden-Wild Corp., 500 Columbia St., Somerville, Mass.  
 Maritime Milling Co., Inc., Buffalo, N. Y.  
 Geo. E. Marsh Co., 393 Chestnut St., Lynn, Mass.  
 Mason Alfalfa Process Co., 1520 Locust St., Philadelphia, Pa.  
 W. T. McLaughlin Co., 16 Railroad St., West Roxbury, Mass.  
 Mellin's Food Company of North America, 177 State St., Boston, Mass. (Registered for A. H. Brown & Bros.)  
 Mennel Milling Co., Toledo, Ohio.  
 Merrimack Farmers' Exchange, Inc., Concord, N. H.  
 Midland Flour Milling Co., Kansas City, Mo.  
 Milmine, Bodman & Co., Inc., 115 Produce Exchange, New York, N. Y.  
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.  
 Jas. F. Morse & Co., Somerville, Mass.  
 Moseley & Motley Milling Co., Mill St., foot of Brown St., Rochester, N. Y.  
 Mt. Vernon Milling Co., Mt. Vernon, Ind.  
 Narragansett Milling Co., East Providence, R. I.  
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.  
 National Cottonseed Products Corp., Memphis, Tenn.  
 National Milling Co., Toledo, Ohio.  
 New England By-Products Corp., 20 West St., Lawrence, Mass.  
 New England Rendering Co., R 39 Market St., Brighton, Mass.  
 Newsome Feed & Grain Co., Carson Sta., Pittsburgh, Penn.  
 Niagara Falls Milling Co., Lockport, N. Y.  
 Noblesville Milling Co., Noblesville, Ind.  
 Northern Illinois Cereal Co., Lockport, Ill.  
 Northwestern Consolidated Milling Co., Minneapolis, Minn.  
 Nowak Milling Corp., Hammond, Ind.

Ogilvie Flour Mills Co., Ltd., Montreal, Que., Canada  
 Ontario Milling Co., Inc., Oswego, N. Y.  
 Louis E. Page, 469 Rutherford Ave., Charlestown, Mass.  
 Thomas Page Mill Co., North Topeka, Kan.  
 Philip R. Park, Inc., Naval Station, San Pedro, Cal.  
 Park & Pollard Co., 356 Hertel Ave., Buffalo, N. Y.  
 George H. Parker Grain Co., Danvers, Mass.  
 Patent Cereals Co., Bradford St., Geneva, N. Y.  
 Pawtucket Rendering Co., Pawtucket, R. I.  
 Pecos Valley Alfalfa Mill Co., Hagerman, N. M.  
 Penick & Ford Ltd., Inc., Cedar Rapids, Iowa.  
 Pillsbury Flour Mills Co., Minneapolis, Minn.  
 Pittsburgh Plate Glass Co., Linseed Oil Division, Newark, N. J.  
 Postum Co., Inc., Battle Creek, Mich.  
 W. N. Potter Grain Stores, Inc., Greenfield, Mass.  
 Pratt Food Co., Inc., Elk St. and Abbott Rd., Buffalo, N. Y.  
 H. C. Puffer Co., Springfield, Mass.  
 Purina Mills. (Registered by Ralston Purina Co.)  
 Quaker Oats Co., Chicago, Ill.  
 Ralston Purina Co., St. Louis, Mo., (Registered for Purina Mills.)  
 John Reardon & Sons Co., Cambridge, Mass.  
 James Richardson & Sons, Ltd., Montreal, Que., Canada.  
 Robin Hood Mills, Ltd., Moose Jaw, Sask., Canada.  
 Reuben W. Ropes, 5 Hobart St., Danvers, Mass.  
 Sigmond Rothschild Co., Houston, Texas.  
 N. Roy & Son, South Attleboro, Mass.  
 Russell-Miller Milling Co., Minneapolis, Minn.  
 Russia Cement Co., Gloucester, Mass.  
 Ryther & Warren, Belchertown, Mass.  
 St. Albans Grain Co., St. Albans, Vt. (Registered also for Cutler Co., North Wilbraham, Mass.)  
 St. Lawrence Flour Mills Co., Ltd., 2110 Notre Dame St. West, Montreal, Que., Canada.  
 Schlosser Brothers, Frankfort, Ind.  
 Sheffield Farms Co., Inc., 524 West 57th St., New York, N. Y.  
 Shellabarger Grain Products Co., Decatur, Ill.  
 Sherwin Williams Co., 101 Prospect Ave., Cleveland, Ohio.  
 Sherwin-Williams Co. of Canada, Ltd., Montreal, Que., Canada. (Registered by Chas. M. Cox Co.)  
 G. B. R. Smith Milling Co., Sherman, Texas.  
 James H. Smith, 102 Hale St., Haverhill, Mass.  
 Smith Bodfish Swift Co., Vineyard Haven, Mass.  
 Soya Products, Inc., Chicago, Ill. (Registered by Allied Mills, Inc.)  
 Springfield Rendering Co., Springfield, Mass.  
 A. E. Staley Manufacturing Co., Decatur, Ill.  
 James Starke, Board of Trade Building, Montreal, Que., Canada.  
 F. W. Stock & Sons, Hillsdale, Mich.  
 Stratton & Co., Concord, N. H.  
 Swift & Co., Union Stock Yards, Chicago, Ill.  
 C. H. Symmes, Winchester, Mass.  
 Syracuse Milling Co., P. O. Box 1141, Syracuse, N. Y.  
 Thornton & Chester Milling Co., 332 North Oak St., Buffalo, N. Y.  
 Tioga-Empire Feed Mills, Inc., Waverly, N. Y.  
 Torrence, Vary Co., 45 Alley St., Lynn, Mass.  
 Traders Feed & Grain Co., Inc., 736 Chamber of Commerce, Buffalo, N. Y. (Registered also for Maple Leaf Milling Co., Ltd.)  
 Ubiko Milling Co., Cincinnati, Ohio.  
 Union Starch & Refining Co., Columbus, Ind.  
 United Co-Operative Farmers, Inc., Fitchburg, Mass.  
 United Mills Co., Inc., Grafton, Ohio.  
 Upper Hudson Rye flour Mills, Inc., 7-9 Madison St., Troy, N. Y.  
 Van Iderstine Co., Long Island City, N. Y.  
 Victor Flour Mills, Inc., Pittsford, N. Y.  
 Waddington Condensed Milk Co., Inc., 102-106 West 24th St., New York, N. Y.  
 Ward Dry Milk Co., St. Paul, Minn.  
 C. P. Washburn Co., Middleboro, Mass.  
 Wayne County Grangers Feed Corp., Clyde, N. Y.  
 H. K. Webster Co., Lawrence, Mass.  
 West Bay City Sugar Co., Bay City, Mich.  
 West-Neshitt, Inc., Oneonta, N. Y.  
 Western Canada Flour Mills, Ltd., Toronto, Ont., Canada. (Registered by Chas. M. Cox Co.)  
 Estate of M. G. Williams, Taunton, Mass.  
 Wilson & Co., Inc., Chicago, Ill.  
 Stanley Wood Grain Co., Taunton, Mass.  
 Worcester Rendering Co., Auburn, Mass.

MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 65

OCTOBER, 1932

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Inspection of Commercial  
Fertilizers

By H. D. Haskins

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This is the fifty-ninth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920.

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Massachusetts State College,

Amherst, Mass.

# INSPECTION OF COMMERCIAL FERTILIZERS FOR THE SEASON OF 1932

By H. D. Haskins, Official Chemist<sup>1</sup>

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## MANUFACTURERS AND BRANDS

Registrations have been perfected in Massachusetts during 1932 by 106 firms, covering 537 brands of mixed fertilizer and unmixed fertilizing materials. The nature of these products is shown by the following classification:

Complete fertilizers . . . . .	329
Ammoniated superphosphates . . . . .	1
Superphosphates with potash . . . . .	3
Dry ground fish, tankage and ground bone . . . . .	58
Fertilizer simples, including organic nitrogen compounds . . . . .	105
Tobacco stems . . . . .	2
Pulverized manures . . . . .	23
Cotton hull ashes and wood ashes . . . . .	4
Peat products . . . . .	10
Stone meal . . . . .	2
Total . . . . .	537

Representative samples of the following brands were not drawn as they were not found on display by our sampling agents.

<sup>1</sup>Assisted by H. Robert DeRose, Albert F. Spelman, J. W. Kuzmeski, Ralph F. Nickerson, Chemists; James T. Howard, C. L. Whiting, A. G. Brigham, G. E. Taylor, Sampling Agents; Harry L. Allen, Laboratory Assistant; Cora B. Grover, Clerk.

## Brands of Fertilizer Registered but Not Sampled.

MANUFACTURER AND BRAND.	GRADE.	MANUFACTURER AND BRAND.	GRADE.
<b>American Agricultural Chemical Co.</b>		<b>Old Deerfield Fertilizer Co., Inc.</b>	
A A Country Club Fertilizer	8-6-4	Old Deerfield 4-8-10, High Potash	4-8-10
Breck's Market Garden Manure	4-8-7		
Blood Tankage	9.87-5.49-0	<b>Pawtucket Rendering Co.</b>	
Ground Tankage	7.40-9.15-0	Special Burnley Mixture	4.10-8-7
<b>Apothecaries Hall Co.</b>		<b>Fred G. Phillips</b>	
Liberty Potato & General Crops 4-8-10	4-8-10	Ferti-Flora 3-3-3	3-3-3
Liberty Potato & Vegetable 2-8-10	2-8-10	<b>Piedmont-Mt. Airy Guano Co., Inc.</b>	
Muriate of Potash	0-0-48	Harvest Brand 4-8-7	4-8-7
		Harvest Brand 7-6-6	7-6-6
<b>Armour Fertilizer Works</b>		<b>Arthur B. Porter, Inc.</b>	
Armours Big Crop Fertilizer 8-16-14	8-16-14	Mowrah Meal	2.50-0-0
Armours Lawn & Garden Grower 5-8-6	5-8-6		
Fish	9-4-0	<b>Premier Poultry Manure Co.</b>	
<b>Clay &amp; Son</b>		Premier Brand Pulverized Sheep Manure	1.65-1-2
Clay's Fertilizer 4-8-2	4-8-2		
<b>Collins Seed Service Co.</b>		<b>Rogers &amp; Hubbard Co.</b>	
Special Sheep Manure	2.25-1-3	Portland Brand 2-10-2 Fertilizer	2-10-2
<b>Eastern States Farmers' Exchange</b>		Portland Brand 8-16-14 Fertilizer	8-16-14
Eastern States 6-3-6 Cranberry	6-3-6	<b>Salem Chemical &amp; Supply Co.</b>	
Eastern States Lime Phosphate	0-16-0	Plant Food 3-4-3	3-4-3
<b>Thomas W. Emerson Co.</b>		<b>Sears, Roebuck &amp; Co.</b>	
Steamed Bone Meal	2.75-24.93-0	Sulphate of Ammonia	20.75-0-0
<b>Excell Laboratories</b>		<b>M. L. Shoemaker &amp; Co., Inc.</b>	
Zenke's "New Plant Life" (Liquid) 1-1-1	1-1-1	"Swift Sure" 5-8-7	5-8-7
<b>H. L. Frost &amp; Co.</b>		<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b>	
Frost's Evergreen Special 8-6-3	8-6-3	Standard United States 0 x 10 x 10	0-10-10
Frost's Shade Tree Special 10-6-6	10-6-6	Standard United States 2 x 8 x 2	2-8-2
<b>Humphreys-Godwin Co.</b>		Standard United States 2 x 8 x 3	2-8-3
Danish Brand Cottonseed Meal	5.75-0-0	Standard United States 5 x 5 x 5	5-5-5
<b>Spencer Kellogg &amp; Sons, Inc.</b>		Standard United States 5 x 8 x 10	5-8-10
Castor Pomace	4.52-0-0	Standard United States Raw Bone Meal	3.70-22-0
<b>L. B. Lovitt &amp; Co.</b>		Standard United States Sulphate of Potash	0-0-48
"Lovit Brand" 43% Cottonseed Meal	6.88-0-0	Standard United States Sulphate of Ammonia	20.56-0-0
<b>Geo. E. Marsh Co.</b>		<b>Victory Fertilizer Corp.</b>	
Fertilizer Bone	1.65-22.88-0	Victory Putting Green Fertilizer 6-8-2	6-8-2
<b>J. H. McCusker &amp; Sons</b>		<b>Virginia-Carolina Chemical Corp., Richmond, Va.</b>	
McCusker Humus Peat	.4-0-0	Bloom Aid, Tablet Form 10-14-6	10-14-6
<b>Merrimac Chemical Co.</b>			
Sulphate of Ammonia	20-0-0		
<b>Miller Fertilizer Co.</b>			
Miller's Superphosphate	0-16-0		

## Drawing of Samples.

Between April 1 and June 15, four sampling agents working independently made a thorough canvass of the state by means of automobile. Counties assigned to each agent were as follows: James T. Howard, Hampshire, Hampden, Franklin and Berkshire; A. G. Brigham, Worcester; G. E. Taylor,



Norfolk, Bristol, Plymouth, Barnstable and Dukes; C. L. Whiting, Essex, Middlesex and Suffolk.

Sampling statistics for the year are as follows: 22,895 sacks were sampled, representing 7,718 tons of fertilizer, thus about one ton to every eight that was sold in the state was sampled; 196 towns were visited; 1,956 samples, representing 489 distinct brands, were drawn from stock in the possession of 610 agents or owners; 209 other agents were called upon, but no samples were taken for the following reasons—agency discontinued, stocks all sold out, stocks included only those brands of which a sufficient number of samples had already been drawn in that territory.

### COMPARATIVE COST OF FERTILIZER CHEMICALS AND UNMIXED FERTILIZER PRODUCTS.

The following table gives average quotations taken from the Oil, Paint and Drug Reporter and Chemical Markets.

#### Wholesale Quotations on Chemicals and Unmixed Materials.

NATURE OF MATERIAL.	AVERAGE PRICE PER TON FOR SIX MONTHS PRECEDING MARCH 1.		Price Per Ton Sept. 26, 1932.	Difference Between Sept. 26 Price and Six Months' Average: Sept. 1, 1931—Mar. 1, 1932.
	1931.	1932.		
Ammonium sulfate (20.5% N), 200 lb. bags, northern ports	\$37.95	\$25.41	\$22.00	-\$3.41
Ammonium sulfate-nitrate (26% N), bags, northern ports	48.57	34.80	No price	-
Nitrate of soda (15.5% N), bags, natural or synthetic, ex vessel	40.54	36.58	24.40	-12.18
Nitrate of lime (15% N), bags, northern ports, ex vessel	41.04	36.24	34.00	-2.24
Nitrate of potash (13% N, 45% K <sub>2</sub> O), bags, c.i.f. ports	-	56.79	56.50	-.29
Urea (46% N), car lots, bags, c.i.f. northern ports	104.08	82.60	82.60	none
Dried blood (12.34% N) ground, bulk, New York	47.60	27.13	25.88	-1.25
Animal tankage (8.23% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), bulk, New York	34.82	16.81	18.50	+1.69
Dry ground fish (9.02% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), bags, Baltimore	59.42	43.06	30.00	-13.06
Cottonseed meal (5.76% N), bags, at mill	24.81	14.71	15.25	+ .54
Castor pomace (4.52% N), bags, f.o.b. works, car lots	-	-	12.00	-
Ground bone (2.47% N, 22.88% P <sub>2</sub> O <sub>5</sub> ), bags, f.o.b. Chicago	26.92	21.00	21.00	none
Superphosphate (16% avail. P <sub>2</sub> O <sub>5</sub> ), bulk, f.o.b. Baltimore	8.75	8.00	7.50	-.50
Muriate of potash (50.54% K <sub>2</sub> O), bags	37.15	37.15	37.15	none
High grade sulfate of potash (48.65% K <sub>2</sub> O), bags	48.25	48.25	47.50	-.75
Potash-magnesia sulfate (25.94% K <sub>2</sub> O), bags	27.80	27.80	27.80	none

The mineral forms of nitrogen have continued to decline in cost during the past season, the outstanding feature being the great drop in price of nitrate of soda, which amounts to \$12.18 per ton, thus making the unit cost of nitrogen from this source more comparable to that of ammonium sulfate. Even so, the unit cost of nitrogen from the latter salt is still 50 cents under that for the nitrate salt.

Superphosphate has declined \$1.25 per ton from the average price for six months ending March 1, 1931, and 50 cents per ton from the average price for the same period for 1932.

Some of the organic ammoniates have declined still further in price from the low figures recorded in 1931, and more recent quotations indicate that a further decline in price is not unexpected. Dry ground fish has led in the price decline, being quoted Sept. 26 for \$13 under the average quotation for six months ending March 1, 1932, while dried blood has shown a further decline of \$1.25 for the same period. Animal tankage and cottonseed meal

have recently shown a small increase in cost, the former being quoted on Sept. 26 \$1.69 and the latter 54 cents higher per ton than for the six months ending March 1, 1932.

High grade sulfate of potash has shown a decline in price of 75 cents per ton, this being the only change recorded for this element.

From the above, it would seem that no material increase in the cost of mixed fertilizers for 1933 can be anticipated, and it is not unlikely that somewhat lower prices may prevail.

The following fertilizer trade values are based on average wholesale quotations taken from trade journals for six months ending March 1, 1932, to which 20 per cent has been added for overhead, proper allowance having also been made for bags, labor, and freight when appropriate.

### Fertilizer Trade Values.

FORM OF PLANT FOOD.	Value per Pound.	Unit Value.
Nitrogen.		
In ammonia salts . . . . .	\$0.075	\$1.50
In nitrates . . . . .	.14	2.80
Organic nitrogen in fish . . . . .	.285	5.70
Organic nitrogen in blood, meat and hoof meal . . . . .	.135	2.70
Organic nitrogen in fine <sup>1</sup> bone and tankage . . . . .	.1375	2.75
Organic nitrogen in coarse <sup>1</sup> bone and tankage and in pulverized manures . . . . .	.0925	1.85
Organic nitrogen in mixed fertilizers . . . . .	.145	2.90
Organic nitrogen in cottonseed meal, castor pomace, etc. . . . .	.175	3.50
Organic nitrogen in calurea and urea . . . . .	.11	2.20
Organic nitrogen in cyanamid . . . . .	.095	1.90
Phosphoric Acid.		
Soluble in water and neutral citrate of ammonia (available) . . . . .	.04875	.975
In fine <sup>1</sup> bone and tankage and in fish . . . . .	.045	.90
In coarse <sup>1</sup> bone and tankage . . . . .	.04	.80
In pulverized manures, seed residues, and ashes . . . . .	.04	.80
Insoluble in mixed fertilizers . . . . .	.02	.40
Potash.		
As sulfate . . . . .	.059	1.18
As muriate . . . . .	.044	.88
As nitrate . . . . .	.04	.80
As carbonate . . . . .	.075	1.50
In pulverized manures, seed residues, and the water insoluble portion in ashes . . . . .	.04	.80

<sup>1</sup>Fine bone and tankage refers to particles which, as sampled, will pass through a sieve with circular openings 1-50 of an inch in diameter. Coarse bone and tankage refers to that portion which will not pass through the sieve.

## FERTILIZER TONNAGE.

## Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts.

	July 1, 1929, to July 1, 1930	July 1, 1930, to July 1, 1931.	July 1, 1931, to July 1, 1932.
Mixed fertilizers . . . . .	42,881	43,463	39,689
Fertilizer chemicals and materials unmixed . . . . .	21,249	19,174	20,325
Pulverized natural manures . . . . .	2,491	2,426	1,939
Totals . . . . .	66,621	65,063	61,953

There were 3,110 tons less fertilizer sold in the state in 1932 than during the previous year. The tonnage of mixed fertilizers was 3,774 less, while that of the fertilizer chemicals and unmixed materials was 1,151 more than in 1931. Pulverized manures showed a decrease of 487 tons.

Of the total tonnage sold, 64.1 per cent was mixed fertilizer, 32.8 per cent was unmixed materials, and 3.1 per cent was pulverized natural manures.

## Plant Food Tonnage.

	Nitrogen.		Phosphoric Acid.		Potash.	
	1931.	1932.	1931.	1932.	1931.	1932.
Mixed fertilizers . . . . .	1,916	1,957	3,473	3,386	2,827	2,725
Fertilizer chemicals and materials unmixed . . . . .	1,084	1,350	1,630	1,476	561	534
Pulverized natural manures . . . . .	42	40	30	27	87	53
Totals . . . . .	3,042	3,347	5,133	4,889	3,475	3,312

There were only 102 tons less of plant food sold in the state than during 1931, although the actual tonnage of fertilizer sold was 3,110 less. Three hundred and five tons more of nitrogen, 244 tons less of available phosphoric acid, and 163 tons less of potash were used in the state than during the previous year.

There were 11,548 tons of plant food sold, of which 28.98 per cent was nitrogen, 42.34 per cent available phosphoric acid, and 28.68 per cent potash. Of the 11,548 tons of plant food sold, 69.86 per cent was furnished in mixed fertilizers, 29.10 per cent from chemicals and unmixed materials, and 1.04 per cent from pulverized manures.

The mixed fertilizers and unmixed materials, including the pulverized manures, furnished the three plant food elements in the following proportions: nitrogen, 58.47 per cent from mixed and 41.53 per cent from unmixed; phosphoric acid, 69.26 per cent from mixed and 30.74 per cent from unmixed; potash, 82.28 per cent from mixed and 17.72 per cent from unmixed fertilizers.

In the tabulation of the tonnage of mixed fertilizers the fertilizer grade is expressed in round numbers and in the order of nitrogen, available phosphoric acid, and potash. This represents the plant food guarantee of each fertilizer grade. In those few cases where fractional numbers are given, the tonnage accompanying the grade was sold during the six months ending January 1, 1932, before the ruling requiring whole numbers in expressing grade became effective. The tonnage tables show sales for one year, from July 1, 1931.

## (a) Tonnage of Mixed Fertilizers.

## COMPLETE FERTILIZERS.

14 per cent or more of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash).

Grade <sup>1</sup>	Tonnage.	Brands.	Grade <sup>1</sup>	Tonnage.	Brands.
5-8-7	9,798	37	10-16-20	98	-
4-8-4	7,200	36	10-20-20	89	-
4-8-7	4,228	27	5-5-5	83	-
4-8-10	1,791	18	3-7-6	61	-
3-10-4	1,428	16	8-6-2	57	-
4-10-5	1,271	-	15-20-15	56	-
7-6-6	1,269	17	7-13-11	52	-
3-8-4	972	-	6-15-9	51	-
4-12-4	882	5	6-7-4	51	-
6-3-6	836	7	10-6-4	50	-
5-8-10	791	8	5-8-6	48	5
4-8-8	614	-	7-3-7	47	-
5-10-4	520	-	4.94-8-4	42	-
2-10-2	435	9	2-12-6	39	-
3-10-6	346	-	3.29-8-7	35	-
4-4-15	279	-	2.47-8-4	33	-
5-4-15	252	-	7-5-2	32	-
8-16-14	247	8	7-8-5	32	-
6-8-6	244	-	9-18-18	32	-
8-16-16	240	-	2-12-2	31	-
4-8-5	239	-	3.29-6-10	29	-
5-5-15	235	-	6-8-2	28	-
5-3-6	229	-	8-24-8	26	-
5-8-12	223	-	3.29-8-10	25	-
8-5-8	218	-	4-12-6	25	-
6-3-7	204	-	16-16-16	24	-
2-12-4	191	7	6-11-10	22	-
4-6-10	166	-	12-16-12	22	-
15-30-15	137	-	2-9-3	21	-
7-12-10	130	-	14-12-12	17	-
2-8-10	126	5	4-16-4	16	-
4.8-2-13	125	-	10-3-3	15	-
6-6-5	125	-	4-8-16	15	-
4-10-6	112	-	Miscellaneous	734	45
5-6-4	109	-	Totals	38,359	331
7-8-6	109	-			

Less than 14 per cent of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash).

5-3-5	862	10	6.58-4-2	16	-
4-1-8	182	-	5-6-2	16	-
4-3-5	143	-	Miscellaneous	53	8
4-1.12-.08	17	-	Totals	1,289	23

## SUPERPHOSPHATES WITH POTASH.

Grade <sup>1</sup>	Tonnage.
0-14-6 . . . . .	32
0-20-20 . . . . .	8
0-10-10 . . . . .	1
Total . . . . .	41

<sup>1</sup>Grade is expressed in terms of nitrogen, available phosphoric acid, and potash.

## (b) Tonnage of Unmixed Fertilizing Materials.

MATERIAL.	Tonnage.	Brands.	MATERIAL.	Tonnage.	Brands.
Cottonseed meal . .	5,127	10	Sulfate of potash . .	159	6
Superphosphate . .	3,937	18	Cotton hull ashes . .	146	3
Ground bone . .	2,660	31	Stone Meal . .	76	2
Pulverized animal manures	1,939	23	Double superphosphate	72	1
Sulfate of ammonia . .	1,783	16	Calcium nitrate . .	67	1
Nitrate of soda . .	1,757	8	Linseed meal . .	30	1
Humus (peat) . .	782	10	Precipitated bone . .	25	5
Muriate of potash . .	647	8	Blood tankage . .	21	3
Castor pomace . .	605	7	Wood ashes . .	18	1
Animal tankage . .	539	14	Dried blood . .	14	2
Tobacco stems . .	490	2	Ammo-Phos . .	13	2
Cyanamid . .	401	1	Synthetic urea . .	11	2
Dry ground fish . .	382	10	Cal-Nitro . .	6	1
Milorganite . .	208	1	Miscellaneous . .	5	5
Basic slag phosphate . .	183	3			
Nitrate of potash . .	161	6	Totals . .	22,264	203

Of the 33,359 tons of complete fertilizer guaranteed to contain 14 per cent or more of available plant food, 77.4 per cent was furnished by 10 grades and 170 brands. Double and multiple strength grades totalled 1,004 tons and 22 brands — 203 tons less than during the previous year.

Of the mixed fertilizer sold, 96.75 per cent contained 14 per cent or over of available plant food, compared with 90.75 per cent in 1931. The tonnage of superphosphates with potash sold during the year was negligible, being only one-tenth of 1 per cent of the total tonnage of mixed goods.

There were 2,613 tons less of low-analysis (less than 14 per cent of available plant food) complete fertilizers sold than in 1931. The 5-3-5 grade, comprising 10 brands, furnished about 67 per cent of the tonnage of these low-analysis goods. About 92 per cent was furnished by 3 grades, comprising 12 brands.

The tonnage of unmixed materials was distributed as follows: nitrogen products, 47.61 per cent; phosphoric acid products, 18.99 per cent; potash products, 4.32 per cent; tankage, fish, bone, tobacco stems, wood ashes, and nitrate of potash, 20.01 per cent; and miscellaneous, 9.07 per cent.

Ten of the most popular grades are listed in the following table in the order of largest tonnage and in comparison with a similar list for 1931.

1931.		1932.	
GRADE.	Tonnage.	GRADE.	Tonnage.
4.11 (5)-8-7 . . . . .	11,921	5-8-7 . . . . .	9,806
3.29 (4)-8-4 . . . . .	8,267	4-8-4 . . . . .	7,337
3.29 (4)-6-10 . . . . .	1,936	4-8-7 . . . . .	4,475
2.47 (3)-8-4 . . . . .	1,633	4-8-10 . . . . .	1,791
4.11 (5)-3-5 . . . . .	1,614	3-10-4 . . . . .	1,428
5.76 (7)-3-7 . . . . .	1,461	7-6-6 . . . . .	1,286
6.58 (8)-6-6 . . . . .	1,018	4-10-5 . . . . .	1,271
4 (4.86)-12-4 . . . . .	1,010	3-8-4 . . . . .	972
4.11 (5)-10-5 . . . . .	963	4-12-4 . . . . .	908
4.94 (6)-3-6 . . . . .	896	5-3-5 . . . . .	862

The adoption of whole numbers in expressing fertilizer grade no doubt made it somewhat more difficult for many users to make their final selection in 1932, thus requiring greater effort on the part of the fertilizer salesman. This may be illustrated by a study of the 5-8-7 grade.

In 1931, 5-8-7 meant 5 per cent ammonia (4.11 per cent nitrogen), 8 per cent available phosphoric acid, and 7 per cent potash; while in 1932, it meant 5 per cent nitrogen, 8 per cent available phosphoric acid, and 7 per cent potash. The tonnage of 5-8-7 was 2,115 less in 1932 than in 1931, many users selecting the 4-8-7 grade, which is more nearly like the 5-8-7 grade of 1931 in analysis, and of which 4,475 tons were sold. However, the tonnage of 5-8-7 sold in 1932 would indicate that many users are convinced that the higher percentage of nitrogen (.89%) is good economy. The combined tonnage of 5-8-7 and 4-8-7 for 1932 was 14,281 which was 2,360 tons more than the tonnage of 5-8-7 in 1931.

Similarly, while the 1932 tonnage of the 4-8-4 grade was less than the tonnage of this grade in 1931, the combined tonnage of 4-8-4 and 3-8-4 in 1932 was 42 tons greater than that of the 4-8-4 grade in the previous year.

It would seem to the writer that with continued low cost of nitrogen, the tonnage of the higher nitrogen grade in each case will gradually increase. It is doubtful economy to maintain indefinitely two fertilizer grades, the limit of variation of which is only 1 per cent of nitrogen when this difference is not measurable or justifiable in terms of crop response.

The 3.29 (4)-6-10 grade, which had the third largest tonnage in 1931, has been replaced by the 4-8-10, which had the fourth largest tonnage in 1932. The 2.47 (3)-8-4 grade, with the fourth largest tonnage in 1931, has been largely replaced by the 3-10-4, which had the fifth largest tonnage in 1932. The 4-10-5 grade, which in 1931 was expressed 4.11 (5)-10-5, was advanced from the ninth to the seventh place in the tonnage sold. The 7-6-6 grade, which in 1931 was expressed 6.58 (8)-6-6, advanced from the seventh to the sixth place, with a tonnage increase of 268. The 5-3-5 grade, 4.11 (5)-3-5 the previous year, occupies the tenth place in 1932, with a tonnage decrease from the previous year of 752. Two other grades of tobacco fertilizer, 5.76 (7)-3-7 and 4.94 (6)-3-6, which occupied sixth and tenth place in the tonnage sold in 1931, now occupy the fourth-ninth and eleventh place, respectively.

### "New England Standard Nine" Grades.

No changes have been made in this list since those recorded in 1931. The tonnage accompanying each grade in the following table shows to what extent the farmers have followed the recommendations of the agronomists, manufacturers and chemists with reference to the selection of fertilizers for the needs of crops grown in New England.

NEW ENGLAND STANDARD NINE GRADES.	Tonnage.	Additional Tonnage from Grades Varying but 1% in One or More Plant Foods.	Total.
5-8-7 . . . . .	9,806 <sup>a</sup>	5,376	15,182
4-8-4 . . . . .	7,337 <sup>b</sup>	1,268	8,605
4-8-10 . . . . .	1,791	914	2,705
7-6-6 . . . . .	1,286 <sup>c</sup>	137	1,423
6-3-6 . . . . .	847 <sup>d</sup>	1,342	2,189
3-10-4 . . . . .	1,428	1,283	2,711
2-12-4 . . . . .	191	—	191
5-8-10 . . . . .	889 <sup>e</sup>	1,791	2,680
2-8-10 . . . . .	136 <sup>f</sup>	—	136
	23,711	12,111	35,822

<sup>a</sup> Including 8 tons of 10-16-14.

<sup>b</sup> Including 137 tons of 15-30-15.

<sup>c</sup> Including 17 tons of 14-12-12.

<sup>d</sup> Including 11 tons of 10-5-10.

<sup>e</sup> Including 98 tons of 10-16-20.

<sup>f</sup> Including 10 tons of 4-16-20.

Of the total tonnage of mixed fertilizers, 59.75 per cent was from grades recommended for New England conditions, and an additional 30.5 per cent was from grades varying but one per cent in one or more plant food elements from the grades advocated: over 90 per cent, therefore, of the total tonnage conformed to the group recommended, or varied from it by one per cent in one or more elements. Of the ten grades, including the multiple strength mixtures, that have the highest tonnage (30,136 tons), only five, totalling 21,648 tons, were among the New England Standard Nine.

About 22 per cent of the total tonnage of mixed fertilizers was from six grades not among the number known as the New England Standard Nine. They are 4-8-7, third largest tonnage sold; 4-10-5, sixth largest; 3-8-4, eighth largest; 4-12-4, ninth largest; 5-3-5, tenth largest; 4-8-8, twelfth largest.



## MIXED FERTILIZERS

## Deficiency Statistics for Mixed Fertilizers.

MANUFACTURER.	NUMBER OF BRANDS.		NUMBER OF TESTS OR DETERMINATIONS.				
	Analyzed.	Approximately Equal to Guarantee in Commercial Valuation.	Totals. (a)	Not Exceeding $\frac{1}{4}$ Per Cent Below Guarantee.	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee.	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee.	More than $\frac{3}{4}$ Per Cent Below Guarantee.
Allied Mills, Inc.	4	4	12	1	2	0	0
American Agricultural Chemical Co.	49	49	147	6	22	1	0
American Soda Products Co.	1	1	3	0	0	0	0
Apothecaries Hall Co.	12	12	36	0	0	0	1
Armour Fertilizer Works	15	15	45	2	3	0	0
Barrie Laboratories, Inc.	1	1	3	0	0	0	0
F. A. Bartlett Tree Expert Co.	1	1	3	0	0	0	0
Berkshire Chemical Co.	14	14	42	1	1	0	1
Joseph Breck & Sons, Corp.	1	1	3	0	0	0	0
Lyman Carrier Products	1	1	3	1	0	0	0
Collins Seed Service Co.	3	3	9	0	1	0	0
Consolidated Rendering Co.	5	5	15	2	1	0	0
Davey Tree Expert Co.	1	1	3	0	0	0	0
John C. Dow Co., Inc.	4	4	12	0	0	0	0
Eastern States Farmers' Exchange	18	17	52	1	0	1	0
Essex Fertilizer Co.	8	8	24	5	0	0	0
Goulard & Olena, Inc.	1	1	3	1	0	0	0
Thomas Hersom & Co.	2	2	6	0	0	0	0
International Agricultural Corp.	14	13	42	2	1	1	1
Henry James & Son, Inc.	4	4	12	0	0	0	0
Little-Tree Farms	1	1	3	0	0	0	0
Lowell Fertilizer Co.	11	11	33	2	2	0	0
Maine Farmers Exchange, Inc.	3	3	9	2	0	0	0
Miller Fertilizer Co.	4	4	12	1	1	0	1
New England Fertilizer Co.	9	9	27	1	1	0	0
Nitrate Agencies Co.	1	1	3	0	0	0	0
Old Deerfield Fertilizer Co., Inc.	16	16	48	2	2	2	0
Olds & Whipple, Inc.	10	10	30	0	0	0	0
Parmenter & Polsey Fertilizer Co.	6	6	18	0	0	0	0
Pawtucket Rendering Co.	3	3	9	0	0	0	0
Pedigreed Seed Co., Inc.	1	1	3	0	0	0	1
Piedmont-Mt. Airy Guano Co., Inc.	5	5	15	0	0	0	0
Plantabbs Corp.	1	1	3	0	0	0	0
Rogers & Hubbard Co.	22	22	66	3	1	1	0
F. S. Royster Guano Co.	5	5	15	2	0	0	0
O. M. Scott & Sons Co.	1	1	3	1	0	0	0
M. L. Shoemaker & Co., Inc.	1	1	2	0	0	0	0
Smith Agricultural Chemical Co.	1	1	3	0	0	0	0
Springfield Rendering Co.	7	7	21	1	1	0	0
Standard Wholesale Phosphate & Acid Works, Inc.	10	8	30	1	1	0	3
Sutton & Sons, Ltd.	1	1	3	0	0	0	0
Swift & Co., Fertilizer Works	1	1	3	0	0	0	0
F. Sylvester & Son	1	1	3	0	0	0	0
Synthetic Nitrogen Products Corp.	1	1	3	0	0	1	0
Tennessee Corp.	1	1	3	0	0	0	0
Victory Fertilizer Corp.	2	2	6	0	0	0	0
Virginia-Carolina Chemical Corp., New York, N. Y.	10	10	30	1	0	0	0
Virginia-Carolina Chemical Corp., Richmond, Va.	1	1	3	0	0	0	0
C. P. Washburn Co.	3	3	9	1	0	1	1
Worcester Rendering Co.	5	5	15	0	0	0	0

a Several analyses of the same brand have been averaged and recorded in the table as one analysis.

## Summary of Deficiencies in Mixed Fertilizers

	1930.	1931.	1932.
Brands deficient in one element . . . . .	94	99	59
Brands deficient in two elements . . . . .	14	15	9
Brands deficient in three elements . . . . .	1	0	0
Brands deficient in nitrogen . . . . .	38	23	18
Brands deficient in available phosphoric acid . . . . .	46	57	27
Brands deficient in potash . . . . .	41	49	32

## Serious Commercial Shortages in Mixed Fertilizers

AMOUNT OF SHORTAGE PER TON.	NUMBER OF BRANDS ACCORDING TO YEARS.			
	1929.	1930.	1931.	1932.
More than \$5 . . . . .	3	1	2	none
Between \$4 and \$5 . . . . .	1	1	none	none
Between \$3 and \$4 . . . . .	1	1	1	2
Between \$2 and \$3 . . . . .	2	none	none	none
Between \$1 and \$2 . . . . .	6	1	3	2

Of the 303 brands analyzed, 235, or 77.5 per cent, showed no deficiencies. Out of 906 plant food guarantees made, 92 per cent were fully maintained. The deficiency table shows the following statistics:

Deficiencies not exceeding  $\frac{1}{4}$  of 1 per cent, 40.

Deficiencies between  $\frac{1}{4}$  and  $\frac{1}{2}$  of 1 per cent, 20.

Deficiencies between  $\frac{1}{2}$  and  $\frac{3}{4}$  of 1 per cent, 8.

Deficiencies more than  $\frac{3}{4}$  of 1 per cent, 9.

Of the total number of guarantees of each element made, 6 per cent of the nitrogen, 8.9 per cent of the available phosphoric acid, and 10.6 per cent of the potash were not met. Ten of the 18 nitrogen deficiencies, 9 of the 27 available phosphoric acid deficiencies, and 21 of the 32 potash deficiencies, did not exceed  $\frac{1}{4}$  of 1 per cent.

There were 5 less shortages in nitrogen, 30 less in available phosphoric acid, and 17 less in potash, than in 1931.

## Mixing Efficiency Table.

MANUFACTURER.	AVERAGE PERCENTAGE OF PLANT FOOD ABOVE OR BELOW THE MINIMUM GUARANTEE.		
	Nitrogen.	Available Phosphoric Acid.	Potash.
American Agricultural Chemical Co. . . . .	+ .18	+ .37	+ .18
Apothecaries Hall Co. . . . .	+ .33	+ .59	+ .68
Armour Fertilizer Works . . . . .	+ .11	+ .24	+ .02
Berkshire Chemical Co. . . . .	+ .29	+ .19	+ .14
Consolidated Rendering Co. . . . .	+ .36	+ .33	+ .19
Eastern States Farmers' Exchange . . . . .	+ .49	+ .61	+ .23
Essex Fertilizer Co. . . . .	+ .23	+ .29	+ .08
International Agricultural Corp. . . . .	+ .30	+ .23	+ .13
Lowell Fertilizer Co. . . . .	+ .28	+ .47	+ .06
New England Fertilizer Co. . . . .	+ .23	+ .29	+ .08
Old Deerfield Fertilizer Co., Inc. . . . .	+ .25	+ .12	+ .39
Olds & Whipple, Inc. . . . .	+ .47	+ .71	+ .95
Parmenter & Polsey Fertilizer Co. . . . .	+ .32	+ .54	+ .12
Piedmont-Mt. Airy Guano Co., Inc. . . . .	+ .29	+ .36	+ .39
Rogers & Hubbard Co. . . . .	+ .25	+ .39	+ .31
F. S. Royster Guano Co. . . . .	+ .04	+ .49	+ .22
Springfield Rendering Co. . . . .	+ .28	+ .37	+ .39
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	+ .06	+ .51	+ .22
Virginia-Carolina Chemical Corp., New York, N. Y. . . . .	+ .23	+ .35	+ .32
Worcester Rendering Co. . . . .	+ .51	+ .53	+ .20

Each of 20 different firms registered five or more brands of mixed fertilizer. The mixing efficiency table lists these manufacturers and shows to what extent provision was made to guard against accidental deficiencies in plant food due to the variation in composition of the unmixed materials or to other details of the process that may not always be absolutely uniform. These data were based upon tonnage as well as composition of the different brands of each manufacturer. It is gratifying to note that all of the twenty firms listed showed an overrun in all three plant food elements. It will be noted, however, that two firms showed an overrun of less than one-tenth of 1 per cent in nitrogen, and four other firms showed an overrun of less than one-tenth of 1 per cent in potash, an amount which is usually considered too small to safely care for accidental variations in the composition of the crude stock materials which go into the mixtures. In available phosphoric acid the overruns were more liberal and were sufficiently high to be safe in all instances.

### **Adoption of Simplified Guarantees on Mixed Fertilizers.**

The past year has marked the adoption of a new and simplified method of expressing the plant food guarantees on mixed fertilizers. In all mixed fertilizers the grade has been made a part of the brand or trade name, and has been expressed in terms and order of nitrogen, available phosphoric acid, and water soluble potash. This has been accompanied in all cases by a formal statement of the minimum guarantee only of these three plant food elements. Exceptions to this rule are but few, and are confined to bone-base mixtures where all of the phosphoric acid is derived from unacidulated bone. In these cases, the total as well as the available or citrate soluble phosphoric acid has been stated. Chemicals, unmixed fertilizer materials, and pulverized animal manures have not been included in this change, and may be guaranteed in fractional percentages as in the past.

It should be very encouraging to the individual manufacturers, as it is to the control officials, that there exists the splendid spirit of cooperation necessary to institute so readily the improvement in grades only recently recommended. That the user will welcome the change can be reasonably anticipated.

### **Explanation of Tables of Analyses.**

**Guarantee.** This column gives the manufacturer's claim or guarantee for the three elements of plant food, nitrogen, available phosphoric acid and potash, in the order stated. The grade of each fertilizer is made a part of the trade name and is expressed as nitrogen, available phosphoric acid and water soluble potash, and in that order.

**Commercial Shortages.** In the table designated "Mixtures showing a commercial shortage of \$1 or more per ton," the column headed "Approximate commercial valuation per ton" gives the sum of the valuation of each plant food element computed from the analysis by use of the trade values adopted by the Massachusetts Fertilizer Control for 1932, which appear on a preceding page of the bulletin.

Under the heading "Approximate commercial shortage per ton" is shown the commercial valuation of the deficiencies or tests found below the guarantee after allowance is made for the value of overruns or tests above the guarantee.

Deficiencies are emphasized by boldface type.

**Mixtures Substantially Complying with the Guarantee.** In addition to the analysis of those fertilizers substantially complying with the guarantee, this table includes also those mixtures that are more or less out of balance; that is, having deficiencies in one or more plant food elements, but having overruns which largely offset the value of the deficiencies.

"Number of samples" indicates the number of samples included in the composite which was analyzed.

*Inferior Nitrogen.* The presence of inferior forms of organic nitrogen is indicated by footnotes.

*Potash Forms.* Wherever tests for chlorine showed a sufficient amount present to unite with all of the potash found, the source of the potash is designated as muriate. Wherever insufficient chlorine was found to account for all of the potash it is evident that forms of potash other than muriate were used. In such cases, the figures under the sub-heading "As muriate" do not imply necessarily that muriate of potash was actually added to the mixture, but that chlorine was present, probably from impurities in the fertilizer chemicals, in amounts to account for the percentage of potash indicated. The balance of the potash found is listed under the sub-heading "In forms other than muriate" and may be derived from sulfate, nitrate, or carbonate, as the case may be.



## Mixtures Substantially Complying with Guarantees.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
	<b>Allied Mills, Inc.</b>								
1	Allied Fertilizers 2-8-10 . . . . .	2-8-10	1.72	none	.33	2.05	8.99	10.47	—
1	Allied Fertilizers 2-12-4 . . . . .	2-12-4	2.00	none	.17	2.17	11.86	4.42	—
1	Allied Fertilizers 4-8-7 . . . . .	4-8-7	3.26	none	.28	3.54	9.63	7.40	—
1	Allied Fertilizers 4-12-4 . . . . .	4-12-4	3.39	none	.29	3.68	12.38	4.88	—
	<b>American Agricultural Chemical Co.</b>								
7	A A Aroostook Potato Manure 5-8-7 . . . . .	5-8-7	4.08	.37	.67	5.12	8.42	7.33	—
2	A A Complete Manure with 10 % Potash 4-8-10 . . . . .	4-8-10	2.68	.46	.88	4.02	8.67	10.54	—
2	A A Corn Favorite 3-10-4 . . . . .	3-10-4	2.32	none	1.36	3.68	10.65	4.15	—
2	A A Corn Favorite 3-10-4 . . . . .	3-10-4	2.54	none	.70	3.24	11.16	4.15	—
4	A A Cranberry Fertilizer 5-6-4 . . . . .	5-6-4	3.50	.55	1.02	5.07	6.31	2.92	1.46
1	A A Double Strength Fertilizer 8-16-14 . . . . .	8-16-14	6.50	1.17	.53	8.20	17.03	14.18	—
2	A A Double Strength Fertilizer 8-16-14 . . . . .	8-16-14	6.78	.71	.65	8.14	16.84	12.86	.99
2	A A Double Strength Fertilizer 8-16-14 . . . . .	8-16-14	6.94	.79	.58	8.31	16.40	13.23	1.50
6	A A General Crop Fertilizer 2-10-2 . . . . .	2-10-2	1.32	none	1.01	2.33	10.52	2.05	—
1	A A Hi-Grade Tobacco Manure 6-3-6 . . . . .	6-3-6	1.36	.57	4.18	6.11	3.06	—	6.71
3	A A Monarch Fertilizer 4-8-4 . . . . .	4-8-4	2.72	.28	1.07	4.07	8.61	4.23	—
2	A A Peerless Potato Manure 4-8-7 . . . . .	4-8-7	3.32	.23	.66	4.21	8.73	7.32	—
2	A A Peerless Potato Manure 4-8-7 . . . . .	4-8-7	2.92	.22	1.03	4.17	8.16	7.40	—

1	A A Potato Grower 5-8-10	.	.	.	.	.	.	3.78	.91	.73	5.42	8.04	10.43
2	A A Potato Grower 5-8-10	.	.	.	.	.	.	3.50	.66	.89	5.10	8.55	10.19
1	A A Potato Grower 5-8-10	.	.	.	.	.	.	3.46	.69	.89	5.04	8.87	10.15
2	A A Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	1.54	none	.64	2.18	8.16	10.54
2	A A Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	1.48	none	.72	2.20	8.29	10.12
1	A A Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	1.26	none	.84	2.10	8.49	10.27
1	A A Tobacco Starter 5-5-15	.	.	.	.	.	.	2.52	.95	1.63	5.10	5.68	16.67
3	A A Tobacco Starter 5-5-15	.	.	.	.	.	.	2.64	.55	1.86	5.05	5.03	11.19
12	A A Top Dresser 7-6-6	.	.	.	.	.	.	6.30	.45	.46	7.21	6.57	6.20
1	Agrico 5-9-6	.	.	.	.	.	.	4.32	.55	.26	5.13	9.75	6.13
6	Agrico for Aroostook 5-8-7	.	.	.	.	.	.	3.80	.59	.65	5.04	8.35	7.32
1	Agrico for Aroostook 5-8-7	.	.	.	.	.	.	3.56	.74	.71	5.01	8.67	7.29
2	Agrico for Aroostook 5-8-7	.	.	.	.	.	.	3.54	1.10	.59	5.23	8.17	7.02
9	Agrico for Aroostook with 10% Potash 5-8-10	.	.	.	.	.	.	3.08	.80	1.07	4.95	8.42	9.85
8	Agrico for Corn 3-10-6	.	.	.	.	.	.	2.26	none	.97	3.23	10.52	6.05
4	Agrico for Corn 3-10-6	.	.	.	.	.	.	2.10	none	1.09	3.19	10.20	6.05
2	Agrico for Fruit 7-6-6	.	.	.	.	.	.	6.38	.48	.45	7.31	6.12	5.58
2	Agrico for Grain 2-12-4	.	.	.	.	.	.	1.48	none	.77	2.25	12.31	4.34
4	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	6.24	.82	.48	7.54	6.12	6.12
5	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	6.18	.85	.42	7.45	6.12	5.73
1	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	5.94	.88	.54	7.36	6.06	5.66
8	Agrico for New England 4-8-10	.	.	.	.	.	.	2.84	.35	.92	4.11	8.67	10.08
1	Agrico for New England 4-8-10	.	.	.	.	.	.	2.74	.55	.95	4.24	8.10	9.83
1	Agrico for Onions 3-10-6	.	.	.	.	.	.	2.52	none	.48	3.00	10.02	5.89
7	Agrico for Truck 4-10-5	.	.	.	.	.	.	3.00	.29	.78	4.07	10.27	5.04
9	Agrico for Truck 4-10-5	.	.	.	.	.	.	2.98	.37	.80	4.15	10.01	5.31
4	Bowler's All Round Fertilizer 3-10-4	.	.	.	.	.	.	2.54	none	.87	3.41	10.65	4.03
8	Bowler's All Round Fertilizer 3-10-4	.	.	.	.	.	.	2.36	none	1.05	3.41	10.08	4.03
4	Bowler's Farm & Garden Phosphate 2-10-2	.	.	.	.	.	.	1.44	none	.80	2.24	10.01	2.09
1	Bowler's Farm & Garden Phosphate 2-10-2	.	.	.	.	.	.	1.42	none	.90	2.32	10.33	2.13
4	Bowler's Farm & Garden Phosphate 2-10-2	.	.	.	.	.	.	1.60	none	.66	2.26	10.14	2.02
1	Bowler's Farm & Garden Phosphate 2-10-2	.	.	.	.	.	.	1.36	none	1.03	2.39	10.46	2.44
1	Bowler's Farm & Garden Phosphate 2-10-2	.	.	.	.	.	.	1.74	none	.58	2.32	10.52	2.05

<sup>a</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.



## Mixtures Substantially Complying with Guarantees — Continued.

Number of Samples.	Name of Manufacturer and Brand.	Guarantee: Nitrogen — Available Phosphoric Acid — Potash.	Nitrogen Found.			Available Phosphoric Acid Found.	Potash (K <sub>2</sub> O) Found.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.		As Muriate.	In Forms Other than Muriate.
1	Bowker's Est.	4-8-4	2.84	.35	1.01	8.67	4.07	—
4	Bowker's Est.	4-8-4	2.74	.46	.90	8.80	4.03	—
1	Bowker's Est.	5-8-7	4.00	.61	.79	8.29	7.29	—
6	Bowker's Est.	5-8-7	3.66	.82	.81	8.42	6.96	—
7	Bowker's Est.	4-8-10	3.16	.44	.58	8.54	10.27	—
7	Bowker's Est.	4-8-10	3.00	.52	.83	8.48	10.12	—
6	Bowker's Est.	4-8-7	3.08	.71	.56	8.67	7.17	—
2	Bowker's Est.	4-8-7	2.98	.31	.97	8.16	7.09	—
7	Bowker's Est.	5-8-7	3.70	.77	.71	8.10	7.25	—
6	Bowker's Est.	5-8-7	3.70	.38	.99	8.29	7.04	—
2	Bowker's Est.	4-8-10	2.94	.29	.91	8.67	10.04	—
7	Bowker's Est.	4-8-7	3.08	.48	.77	8.49	7.42	—
6	Bowker's Est.	4-8-7	2.94	.36	.89	8.36	7.29	—
1	Bowker's Est.	2-10-2	1.16	none	.97	10.78	2.33	—
2	Bowker's Est.	2-10-2	1.44	none	.74	10.01	2.56	—
16	Bowker's Est.	4-8-4	2.94	.54	.81	8.42	4.15	—
3	Bowker's Est.	4-8-4	2.80	.39	.87	8.36	4.03	—
5	Bowker's Est.	3-10-4	2.26	none	1.03	10.27	4.15	—
2	Bowker's Est.	3-10-4	2.82	none	.86	10.21	4.26	—
2	Bowker's Est.	3-10-4	2.80	none	1.17	9.70	5.18	—
3	Bowker's Est.	2-10-4	1.48	none	.90	9.75	4.26	—
4	Bowker's Est.	4-8-4	3.12	.41	.65	8.23	4.42	—

## American Agricultural Chemical Co. — Concluded.

1	Bowker's Est.	4-8-4	2.84	.35	1.01	8.67	4.07	—
7	Bowker's Est.	4-8-4	2.74	.46	.90	8.80	4.03	—
6	Bowker's Est.	5-8-7	4.00	.61	.79	8.29	7.29	—
7	Bowker's Est.	5-8-7	3.66	.82	.81	8.42	6.96	—
7	Bowker's Est.	4-8-10	3.16	.44	.58	8.54	10.27	—
6	Bowker's Est.	4-8-10	3.00	.52	.83	8.48	10.12	—
2	Bowker's Est.	4-8-7	3.08	.71	.56	8.67	7.17	—
7	Bowker's Est.	4-8-7	2.98	.31	.97	8.16	7.09	—
7	Bowker's Est.	5-8-7	3.70	.77	.71	8.10	7.25	—
6	Bowker's Est.	5-8-7	3.70	.38	.99	8.29	7.04	—
2	Bowker's Est.	4-8-10	2.94	.29	.91	8.67	10.04	—
7	Bowker's Est.	4-8-7	3.08	.48	.77	8.49	7.42	—
6	Bowker's Est.	4-8-7	2.94	.36	.89	8.36	7.29	—
1	Bowker's Est.	2-10-2	1.16	none	.97	10.78	2.33	—
2	Bowker's Est.	2-10-2	1.44	none	.74	10.01	2.56	—
16	Bowker's Est.	4-8-4	2.94	.54	.81	8.42	4.15	—
3	Bowker's Est.	4-8-4	2.80	.39	.87	8.36	4.03	—
5	Bowker's Est.	3-10-4	2.26	none	1.03	10.27	4.15	—
2	Bowker's Est.	3-10-4	2.82	none	.86	10.21	4.26	—
2	Bowker's Est.	3-10-4	2.80	none	1.17	9.70	5.18	—
3	Bowker's Est.	2-10-4	1.48	none	.90	9.75	4.26	—
4	Bowker's Est.	4-8-4	3.12	.41	.65	8.23	4.42	—

1	E. Frank Coe's Gold Brand Fertilizer 3-10-4	.	.	.	3-10-4	2.36	none	.89	3.25	10.46	4.03	-
2	Co-Op 4-8-4 Fertilizer	.	.	.	4-8-4	2.82	.34	.95	4.11	8.55	4.03	-
1	Co-Op 4-8-4 Fertilizer	.	.	.	4-8-4	2.70	.42	.92	4.04	8.23	4.03	-
4	Co-Op 4-8-7 Fertilizer	.	.	.	4-8-7	2.96	.62	.80	4.38	8.42	7.13	-
3	Co-Op 5-8-7 Fertilizer	.	.	.	5-8-7	3.86	.60	.92	5.38	8.23	7.44	-
4	Co-Op 5-8-7 Fertilizer	.	.	.	5-8-7	3.60	.61	.84	5.05	8.16	7.13	-
2	Co-Op 7-6-6 Fertilizer	.	.	.	7-6-6	6.28	.48	.48	7.24	6.63	6.32	-
2	Co-Op 7-6-6 Fertilizer	.	.	.	7-6-6	6.44	.18	.56	7.18	6.44	6.12	-
4	Co-Op 8-16-14 Fertilizer	.	.	.	8-16-14	6.60	.82	.96	8.38	16.52	14.58	-
2	Co-Op 8-16-14 Fertilizer	.	.	.	8-16-14	6.36	.87	.96	7.83	16.58	14.19	-
1	Double A Tobacco Fertilizer 5-3-5	.	.	.	5-3-5	1.26	.53	2.72	4.51	2.42	-	6.33
1	National Complete Tobacco Fertilizer 5-3-5	.	.	.	5-3-5	1.22	.46	3.34	5.02	3.00	-	5.31
1	National Market Garden Fertilizer 3-10-4	.	.	.	3-10-4	2.56	.24	.26	3.06	10.33	4.19	-
1	National Pine Tree Brand 4-8-4	.	.	.	4-8-4	3.56	none	.49	4.05	9.38	4.30	-
2	National Pine Tree Brand 4-8-4	.	.	.	4-8-4	3.46	none	.54	4.00	8.03	4.19	-
1	Sanderson's Extra High Grade Fertilizer 5-8-7	.	.	.	5-8-7	4.02	.48	.74	5.24	8.03	6.98	-
2	Sanderson's Formula A 4-8-4	.	.	.	4-8-4	2.80	.47	.84	4.11	8.17	4.03	-
1	Sanderson's Formula A 4-8-4	.	.	.	4-8-4	2.56	.58	1.04	4.18	7.91	4.65	-
1	Sanderson's Formula B 4-8-7	.	.	.	4-8-7	3.54	.40	.60	4.54	9.31	-	7.27
1	Sanderson's Formula B 4-8-7	.	.	.	4-8-7	3.50	none	.57	4.07	8.41	6.32	-
American Soda Products Co.												
1	Grogreen 3-8-3	.	.	.	3-8-3	2.94	none	1.90	4.84	8.86	1.15	2.57
1	Grogreen 3-8-3	.	.	.	3-8-3	3.22	.14	2.32	5.68	8.80	1.23	2.22
Apothecaries Hall Co.												
1	Liberty Corn 2-10-2	.	.	.	2-10-2	1.68	none	.89	2.57	10.21	2.44	-
1	Liberty Corn 2-10-2	.	.	.	2-10-2	1.64	none	.68	2.32	10.39	2.06	-
1	Liberty Fish, Bone & Potash 3-10-4	.	.	.	3-10-4	1.82	1.38	.20	3.40	10.58	4.30	-

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Apothecaries Hall Co. — Concluded.									
1	Liberty High Grade Corn 2-12-4	2-12-4	1.94	none	.54	2.48	12.06	4.03	—
1	Liberty High Grade Corn 2-12-4	2-12-4	2.04	none	.31	2.35	12.24	4.34	—
3	Liberty High Grade Market Gardeners 5-8-7	5-8-7	2.48	1.93	.95	5.36	8.80	7.63	—
1	Liberty High Grade Market Gardeners 5-8-7	5-8-7	2.60	2.26	.90	5.76	8.61	7.36	—
2	Liberty Market Gardeners Special 4-8-4	4-8-4	2.16	1.05	1.03	4.24	8.54	4.46	—
1	Liberty Market Gardeners Special 4-8-4	4-8-4	2.56	.20	1.35	4.11	8.23	4.73	—
1	Liberty Onion Special (Potash as Sulphate) 4-8-7	4-8-7	1.90	1.42	1.07	4.39	10.46	—	8.41
3	Liberty Onion Special (Potash as Sulphate) 4-8-7	4-8-7	2.56	.60	1.32	4.48	9.31	—	7.17
1	Liberty Special Fertilizer for Fruit 7-8-6	7-8-6	2.70	4.26	.35	7.31	8.03	6.71	—
1	Liberty Tobacco Special 5-3-5	5-3-5	.30	1.54	3.38	5.22	3.18	—	5.43
1	Liberty Tobacco Special 5-3-5	5-3-5	.24	1.15	3.56	4.95	3.26	—	6.34
1	Liberty Tobacco Starter with Potash 5-4-15	5-4-15	.16	2.07	2.86	5.09	4.21	—	16.58
2	Liberty Tobacco Starter with Potash 5-4-15	5-4-15	none	2.12	2.98	5.10	5.43	—	17.72
1	Liberty Top Dresser for Grass & Grain 8-8-8	8-8-8	6.16	none	2.48	8.64	8.54	10.43	—
1	Liberty Top Dresser for Grass & Grain 8-8-8	8-8-8	6.08	none	2.40	8.48	8.16	9.73	—
1	Liberty Tree & Shrub Food 10-8-8	10-8-8	3.34	5.75	1.17	10.26	7.21	8.06	—
1	Liberty Fertilizer 10-16-14	10-16-14	4.12	2.81	3.09	10.02	16.52	14.42	—
Armour Fertilizer Works									
1	Armours Big Crop Fertilizers 2-8-10	2-8-10	1.96	none	.37	2.33	8.29	10.43	—
2	Armours Big Crop Fertilizers 2-12-4	2-12-4	2.00	none	.30	2.30	11.74	4.03	—
2	Armours Big Crop Fertilizers 3-10-4	3-10-4	2.08	none	.88	2.96	10.27	4.03	—

10	Armours Big Crop Fertilizers 4-8-4	.	.	.	.	4-8-4	3.58	none	.47	4.05	8.23	4.11	-
3	Armours Big Crop Fertilizers 4-8-7	.	.	.	.	4-8-7	2.62	.60	.99	4.21	8.36	7.09	-
4	Armours Big Crop Fertilizers 4-8-10	.	.	.	.	4-8-10	3.84	none	.28	4.12	7.91	10.31	-
1	Armours Big Crop Fertilizers 4-16-4	.	.	.	.	4-16-4	3.44	.22	.49	4.15	16.01	4.22	-
9	Armours Big Crop Fertilizers 5-8-7	.	.	.	.	5-8-7	3.30	.70	1.06	5.06	8.23	7.09	-
1	Armours Big Crop Fertilizers 6-11-10	.	.	.	.	6-11-10	5.20	.63	.25	6.08	11.42	9.20	.80
1	Armours Big Crop Fertilizers 7-6-6	.	.	.	.	7-6-6	6.64	.60	.08	7.32	6.32	6.20	-
2	Armours Big Crop Fertilizers Tobacco Special 5-3-5	.	.	.	.	5-3-5	.22	2.33	2.63	5.18	3.44	-	5.00
2	Armours Big Crop Fertilizers Tobacco Special 6-3-6	.	.	.	.	6-3-6	.30	2.29	3.53	6.12	3.06	-	5.74
1	Armours Big Crop Fertilizers Tobacco Starter 5-5-15	.	.	.	.	5-5-15	.58	3.56	.87	5.01	5.30	-	14.65
1	Armours Special Turf Fertilizer 10-8-6	.	.	.	.	10-8-6	9.12	.76	.27	10.15	9.00	5.02	1.22
2	Armours Vert - The Green Colored Plant Food 5-8-6	.	.	.	.	5-8-6	4.64	.31	.39	5.34	8.42	4.19	2.17
<b>Barrie Laboratories, Inc.</b>													
2	Barrie's Plant Food 6-7-6	.	.	.	.	6-5-7.5-6.5	.30	1.59	5.22	7.11	8.87	6.24	1.16
<b>F. A. Bartlett Tree Expert Co.</b>													
1	Bartlett Green Tree Food 6-7-4	.	.	.	.	6-7-4	5.12	none	1.30	6.42	9.05	4.69	-
<b>Berkshire Chemical Co.</b>													
1	Berkshire Asparagus Fertilizer 4-10-5	.	.	.	.	4-10-5	2.54	none	1.89	4.43	10.01	5.50	-
1	Berkshire Asparagus Special Fertilizer 5-12-6	.	.	.	.	5-12-6	3.66	none	1.75	5.41	12.06	6.36	-
2	Berkshire Complete Fertilizer 2-12-2	.	.	.	.	2-12-2	1.70	none	1.20	2.90	11.22	2.75	-
2	Berkshire Complete Tobacco Fertilizer 4-3-5	.	.	.	.	4-3-5	none	.76	3.36	4.12	3.44	-	5.58
1	Berkshire Economical Grass Fertilizer 8-3-8	.	.	.	.	8-3-8	none	7.54	.96	8.50	7.15	2.38	6.26
1	Berkshire Grass Special Fertilizer 6-6-5	.	.	.	.	6-6-5	1.62	1.18	2.73	5.53	6.70	6.09	-
3	Berkshire Grass Special Fertilizer 6-6-5	.	.	.	.	6-6-5	4.94	none	1.55	6.49	6.76	5.04	-

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Berkshire Chemical Co. — Concluded.										
1	Berkshire High Grade Tobacco Fertilizer 5-3-6	5-3-6	none	1.01	4.33	5.34	3.38	—	6.13	
1	Berkshire Long Island Special Fertilizer 4-8-7	4-8-7	2.86	none	1.55	4.41	8.55	7.87	—	
1	Berkshire Long Island Special Fertilizer 4-8-7	4-8-7	2.98	none	1.35	4.33	8.48	7.36	—	
11	Berkshire Long Island Special Fertilizer 4-8-7	4-8-7	2.78	none	1.55	4.33	8.86	7.29	—	
1	Berkshire Market Garden Fertilizer 3-8-4	3-8-4	2.18	none	.99 <i>b</i>	3.17	8.54	4.61	—	
8	Berkshire Market Garden Fertilizer 3-8-4	3-8-4	2.02	none	1.29	3.31	8.87	4.26	—	
4	Berkshire Onion Special 4-8-4	4-8-4	2.26	.54	1.33 <i>b</i>	4.13	8.29	4.54	—	
1	Berkshire Tobacco Special Fertilizer 6-3-7	6-3-7	.30	2.70	3.22	6.22	2.87	—	8.31	
4	Berkshire Tobacco Starter Fertilizer 4-4-15	4-4-15	none	2.04	2.49	4.53	4.33	—	14.75	
2	Berkshire Tobacco Starter Fertilizer 4-4-15	4-4-15	.24	2.14	1.68	4.06	4.33	1.97 <i>a</i>	15.20	
5	Berkshire Truck Fertilizer 4-8-5	4-8-5	2.46	none	1.93	4.39	8.17	5.93	—	
1	Berkshire 8-16-14 Fertilizer	8-16-14	6.78	none	1.36	8.14	15.50	15.51	—	
Joseph Breck & Sons Corp.										
1	Breck's Special Market Garden Manure 5-8-7	5-8-7	2.88	.86	1.64	5.38	8.74	3.37	4.42	
Lyman Carrier Products										
1	Lecco, Complete Grass Food 7-7-1	7-7-1	3.94	none	3.82	7.76	6.96	1.15	.32	
Clay & Son										
1	Clay's Fertilizer (old stock)	4-1.12-.08	2.08	none	3.16	5.24	4.14	.16	.23	
Collins Seed Service Co.										
1	Casta-Poma Grass Manure 5-6-2	5-6-2	.56	.77	4.14	5.47	6.12	—	2.21	

1	Complete Grass Manure 6-8-1	.	.	.	.	6-8-1	.56	1.60	4.03	6.19	8.03	1.51	-
1	General Purpose Manure (old stock)	.	.	.	.	3-30-10-2	2.28	.32	.71	3.31	10.14	2.36	-
2	Ver-Best Putting Green Manure 7-8-2	.	.	.	.	7-8-2	1.26	.63	4.82	6.71	8.80	1.07	1.26
<b>Consolidated Rendering Co.</b>													
4	Corenco 5-8-7 with Magnesium (c)	.	.	.	.	5-8-7	3.26	.67	1.15	5.08	8.42	7.09	-
1	Corenco 5-8-7 with Magnesium (c)	.	.	.	.	5-8-7	3.22	.71	1.07	5.00	8.36	6.45	-
1	Corenco 5-16-7	.	.	.	.	5-16-7	2.90	.75	1.63	5.28	16.46	7.21	-
2	Corenco 7-13-11	.	.	.	.	7-13-11	4.86	1.11	1.34	7.31	13.13	10.62	-
1	Corenco 8-16-14	.	.	.	.	8-16-14	5.84	1.51	1.27	8.62	15.75	14.19	-
1	New England 8-6-2 Putting Green Special	.	.	.	.	8-6-2	5.14	none	3.42	8.56	6.76	.90	1.93
<b>Davey Tree Expert Co.</b>													
1	Davey Tree Food 10-3-3	.	.	.	.	10-3-3	6.32	1.62	2.25	10.19	3.64	1.48	1.89
<b>John C. Dow Co., Inc.</b>													
2	Dow's 3-10-4	.	.	.	.	3-10-4	1.64	.50	1.19	3.33	10.52	4.22	-
3	Dow's 4-8-4	.	.	.	.	4-8-4	2.70	.42	1.29	4.41	8.74	4.15	-
4	Dow's 5-8-7	.	.	.	.	5-8-7	3.48	.51	1.10	5.09	8.80	7.25	-
3	Dow's 4-8-10	.	.	.	.	4-8-10	2.78	.37	1.24	4.39	8.61	10.08	-
<b>Eastern States Farmers' Exchange</b>													
1	Eastern States 0-14-6 (d)	.	.	.	.	0-14-6	-	-	-	-	14.92	6.47	-
4	Eastern States 0-14-6 (d)	.	.	.	.	0-14-6	-	-	-	-	14.92	6.59	-
1	Eastern States 0-20-20 (e)	.	.	.	.	0-20-20	-	-	-	-	19.26	23.53	-
4	Eastern States 0-20-20 (e)	.	.	.	.	0-20-20	-	-	-	-	20.79	20.00	-

<sup>a</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

<sup>b</sup> The water insoluble organic nitrogen was of inferior quality.

<sup>c</sup> Magnesium oxide guaranteed, 2%; found in composite of 4 samples, 2.03%; found in 1 sample, 1.88%.

<sup>d</sup> Magnesium oxide guaranteed, 1.50%; found in 1 sample, 2.90%; found in composite of 4 samples, 2.97%.

<sup>e</sup> Magnesium oxide guaranteed, 2.50%; found in 1 sample, 3.04%; found in composite of 4 samples, 2.90%.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Eastern States Farmers' Exchange — Concluded.										
1	Eastern States 2-12-6 (f)	2-12-6	1.56	.29	.51	2.36	12.76	5.75	1.03	
4	Eastern States 2-12-6 (f)	2-12-6	1.44	.34	.60	2.38	12.88	4.03	2.91	
3	Eastern States 4-8-8 (g)	4-8-8	3.34	.74	.54	4.62	8.55	9.54	—	
8	Eastern States 4-8-8 (g)	4-8-8	3.22	.97	.33	4.52	8.55	8.49	—	
1	Eastern States 4-10-6 (h)	4-10-6	3.10	.88	.59	4.57	10.72	4.85	2.34	
2	Eastern States 4-10-6 (h)	4-10-6	3.22	.86	.56	4.64	10.84	4.93	2.09	
3	Eastern States 4-12-4 (i)	4-12-4	2.70	1.16	.55	4.41	12.76	—	4.65	
5	Eastern States 4-12-4 (i)	4-12-4	2.74	1.22	.61	4.57	12.76	—	4.57	
3	Eastern States 4-16-20 (j)	4-16-20	2.94	.99	.78	4.71	16.71	22.32	—	
2	Eastern States 5-5-15 Tobacco (k)	5-5-15	.24	3.34	2.96	6.54	5.42	—	16.98	
2	Eastern States 6-8-6 (l)	6-8-6	4.18	1.46	.95	6.59	8.67	—	6.94	
4	Eastern States 6-8-6 (l)	6-8-6	4.06	1.55	.77	6.38	8.93	—	6.98	
2	Eastern States 6-15-9 (m)	6-15-9	4.80	1.05	.93	6.78	15.82	8.71	.98	
3	Eastern States 8-16-16 (n)	8-16-16	6.08	1.91	.51	8.50	16.27	13.35	3.09	
5	Eastern States 8-16-16 (n)	8-16-16	6.14	1.55	.71	8.40	16.20	13.55	3.20	
3	Eastern States 8-16-16 (n)	8-16-16	6.16	1.79	.68	8.63	16.20	11.09	5.35	
1	Eastern States 8-16-16 Low Chlorine Special (o)	8-16-16	6.14	1.84	.53	8.51	16.84	—	16.16	
1	Eastern States 8-24-8 (p)	8-24-8	5.38	2.70	.62	8.70	24.56	2.14 <sup>a</sup>	7.41	
1	Eastern States 8-24-8 (p)	8-24-8	5.06	2.67	1.17	8.90	24.24	—	9.42	
2	Eastern States 10-5-10 (q)	10-5-10	.66	3.20	6.87	10.73	5.87	—	11.82	
3	Eastern States 10-20-20 (r)	10-20-20	7.34	2.16	.52	10.02	20.66	14.29	8.42	
3	Eastern States 10-20-20 (r)	10-20-20	7.78	2.53	.41	10.72	20.41	14.46	7.02	



4	Eastern States 15-20-15 (s)	.	.	.	.	15-20-15	8.54	3.92	3.02	15.48	20.92	5.42 <sup>a</sup>	10.32
1	Eastern States 15-20-15 (s)	.	.	.	.	15-20-15	8.52	3.30	2.75	14.57	21.69	—	13.96
1	Eastern States 15-20-15 (s)	.	.	.	.	15-20-15 <sup>h</sup>	8.18	3.38	2.69	14.25	20.54	—	15.36
1	Nitrophoska 10-20-20	.	.	.	.	10-20-20	7.40	none	3.05	10.45	21.17	20.16	—
1	Nitrophoska 16-16-16	.	.	.	.	16-16-16	6.02	none	10.26	16.28	15.56	18.26	—
3	Nitrophoska 16-16-16	.	.	.	.	16-16-16	6.30	none	9.86	16.16	16.46	16.98	—
Essex Fertilizer Co.													
2	Essex 2-10-2 A 1 Super	.	.	.	.	2-10-2	1.08	none	1.43	2.51	10.52	2.05	—
1	Essex 3-10-4 Fish Brand Fertilizer for All Crops	.	.	.	.	3-10-4	1.58	.18	1.27	3.03	10.01	4.15	—
1	Essex 3-10-4 Fish Brand Fertilizer for All Crops	.	.	.	.	3-10-4	1.46	.21	1.14	2.81	10.01	3.55	—
2	Essex 4-8-4 Market Garden	.	.	.	.	4-8-4	2.74	.48	.92	4.14	8.29	4.26	—
4	Essex 4-8-4 Market Garden	.	.	.	.	4-8-4	3.08	1.21	.65	4.94	8.48	4.07	—
2	Essex 4-8-7 Old General Crop Manure	.	.	.	.	4-8-7	2.66	.23	1.32	4.21	8.17	7.09	—
1	Essex 4-8-10 Peerless Potato Manure	.	.	.	.	4-8-10	2.78	.74	.99	4.51	8.68	10.12	—
3	Essex 4-8-10 Peerless Potato Manure	.	.	.	.	4-8-10	2.64	.35	1.28	4.27	8.29	9.83	—
1	Essex 5-8-7 Complete Manure	.	.	.	.	5-8-7	3.50	.51	1.13	5.14	8.55	7.79	—
6	Essex 5-8-7 Complete Manure	.	.	.	.	5-8-7	3.34	.47	1.19	5.00	8.29	7.09	—

<sup>a</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

<sup>o</sup> Magnesium oxide guaranteed, 1.60%; found, 2.61%.

<sup>f</sup> Magnesium oxide guaranteed, .80%; found in 1 sample, 1.25%; found in composite of 4 samples, 1.96%.

<sup>g</sup> Magnesium oxide guaranteed, .80%; found in composite of 3 samples, 1.74%; found in composite of 8 samples, 2.10%.

<sup>h</sup> Magnesium oxide guaranteed, .80%; found in 1 sample, 1.81%; found in composite of 2 samples, 1.88%.

<sup>i</sup> Magnesium oxide guaranteed, .80%; found in composite of 3 samples, 1.45%; found in composite of 5 samples, 1.88%.

<sup>j</sup> Magnesium oxide guaranteed, 1.60%; found, 2.17%.

<sup>k</sup> Magnesium oxide guaranteed, 2%; found, 2.03%.

<sup>l</sup> Magnesium oxide guaranteed, .80%; found in composite of 2 samples, 2.03%; found in composite of 4 samples, 2.32%.

<sup>m</sup> Magnesium oxide guaranteed, 1.20%; found, 2.17%.

<sup>n</sup> Magnesium oxide guaranteed, 1.60%; found in composite of 3 samples, 2.61%; found in composite of 5, 2.61%; found in composite of 3, 2.61%.

<sup>p</sup> Magnesium oxide guaranteed, 1.60%; found in 1 sample, 2.90%; found in 1 sample 3.18%.

<sup>q</sup> Magnesium oxide guaranteed, 1.20%; found, 2.10%.

<sup>r</sup> Magnesium oxide guaranteed, 2%; found in composite of 3 samples, 2.46%; found in composite of 3 samples, 2.90%.

<sup>s</sup> Magnesium oxide guaranteed, 2%; found in composite of 4 samples, 2.10%; found in 1 sample, 2.03%; found in 1 sample, 2.03%.

<sup>t</sup> One other sample was deficient; see analysis in table of "Mixtures showing a commercial shortage of \$1 or more per ton."

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Essex Fertilizer Co. — Concluded.										
2	Essex 5-8-10 Banner Brand for Potatoes	5-8-10	2.80	.86	1.32	4.98	8.04	10.12	—	
1	Essex 7-6-6 Top Dressing	7-6-6	6.32	none	.94	7.26	6.51	5.93	—	
Excell Laboratories										
1	Zenke's "New Plant Life" (Liquid) (old stock)	1.40-1.07-.54	.86	.74	—	1.60	1.28	—	1.51	
Gouldard & Olena, Inc.										
2	Lawn & Garden (No-Filler) 5-8-5	5-8-5	2.84	.16	2.32	5.32	8.42	4.80	—	
Grasselli Chemical Co.										
1	Grasselli Plant Food (old stock)	4-12-13-4	3.48	none	.74	4.22	15.88	4.30	—	
Thomas Hersom & Co.										
4	Neverfail 4-8-4	4-8-4	2.40	.31	1.71	4.42	8.42	5.12	—	
7	Neverfail 5-8-7	5-8-7	2.64	.62	2.29	5.55	8.16	6.65	.48	
International Agricultural Corp.										
1	International 2-12-4	2-12-4	1.86	none	.24	2.10	12.12	4.34	—	
3	International 2-12-4	2-12-4	1.64	.53	.59	2.76	11.80	4.57	—	
1	International 3-10-4	3-10-4	2.54	none	.63	3.17	10.01	4.07	—	
4	International 3-10-4	3-10-4	2.58	none	.84	3.42	10.20	4.07	—	
2	International 4-8-4	4-8-4	3.78	none	.57	4.35	8.03	4.07	—	
11	International 4-8-4	4-8-4	3.56	none	1.01	4.57	8.29	4.03	—	

2	International 4-8-7	.	.	.	.	.	.	.	.	3.60	none	.92	4.52	8.03	7.48	-
5	International 4-8-7	.	.	.	.	.	.	.	.	3.56	none	.98	4.54	8.16	7.05	-
4	International 4-8-10	.	.	.	.	.	.	.	.	3.60	none	.60	4.20	8.42	10.35	-
4	International 4-8-10	.	.	.	.	.	.	.	.	3.78	none	.70	4.48	8.04	10.08	-
8	International 5-8-7	.	.	.	.	.	.	.	.	4.40	.05	.66	5.11	8.23	7.21	-
5	International 5-8-7	.	.	.	.	.	.	.	.	5.13	none	.12	5.25	8.36	7.05	-
1	International 7-6-6	.	.	.	.	.	.	.	.	6.38	none	.81	7.19	6.57	6.67	-
6	International 7-6-6	.	.	.	.	.	.	.	.	5.78	none	1.32	7.10	6.38	6.09	-
1	International Multiple Strength (old stock)	.	.	.	.	.	.	.	.	5.00	.47	1.53	7.00	11.67	19.06	-
1	International 8-16-14	.	.	.	.	.	.	.	.	5.74	none	2.41	8.15	16.27	14.10	-
1	International 10-16-20	.	.	.	.	.	.	.	.	5.30	2.19	2.86	10.35	15.89	17.83	2.94
3	International 10-16-20	.	.	.	.	.	.	.	.	5.18	2.15	2.81	10.14	15.12	17.99	2.01
1	International Tobacco Starter 5-8-16	.	.	.	.	.	.	.	.	.38	1.40	3.35	5.13	8.93	-	16.43
2	International Caribbee 4-12-6	.	.	.	.	.	.	.	.	1.36	1.50	1.50	4.36	13.01	2.55	3.96
1	International Caribbee 4-12-6	.	.	.	.	.	.	.	.	1.10	2.00	1.44	4.54	12.06	1.81	4.39
2	International Caribbee 5-8-7	.	.	.	.	.	.	.	.	2.24	1.36	1.76	5.36	8.23	2.22a	5.11
3	International Caribbee 5-8-7	.	.	.	.	.	.	.	.	2.02	1.26	2.24	5.52	8.61	-	7.09
3	International Caribbee 7-12-10	.	.	.	.	.	.	.	.	2.56	1.94	2.62	7.12	12.70	-	10.08
4	International Caribbee 7-12-10	.	.	.	.	.	.	.	.	2.84	2.17	2.51	7.52	12.37	-	9.84
<b>Henry James &amp; Son, Inc.</b>																
1	4-8-4 General Garden Fertilizer	.	.	.	.	.	.	.	.	3.36	.53	1.36	5.25	8.86	7.58	-
1	4-8-7 Potato & Vegetable Fertilizer	.	.	.	.	.	.	.	.	2.64	.43	1.28	4.35	8.16	7.13	-
1	5-8-7 Market Garden Fertilizer	.	.	.	.	.	.	.	.	3.34	.60	1.38	5.32	8.03	7.09	-
1	6-3-6 Tobacco Special Fertilizer	.	.	.	.	.	.	.	.	.12	2.26	3.95	6.33	4.47	-	6.55
<b>Little-Tree Farms</b>																
1	Little-Tree No Weeds Lawn Fertilizer and Food for Trees 5-8-6	.	.	.	.	.	.	.	.	6.40	none	.67	7.07	8.29	7.95	-

<sup>a</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Lowell Fertilizer Co.										
1	Lowell 2-10-2 Bone Brand	2-10-2	1.08	none	1.01	2.09	10.01	2.33	—	
4	Lowell 2-10-2 Bone Brand	2-10-2	1.08	none	1.66	2.74	10.02	3.10	—	
6	Lowell 3-10-4 Animal Brand	3-10-4	1.50	.64	1.36	3.50	10.27	4.03	—	
3	Lowell 4-8-4 Corn and Vegetable	4-8-4	2.66	.27	1.18	4.11	9.12	4.07	—	
10	Lowell 4-8-4 Corn and Vegetable	4-8-4	2.56	.62	1.23	4.41	8.48	4.03	—	
1	Lowell 4-8-7 Old General Crop Manure	4-8-7	2.60	.62	1.34	4.56	8.80	6.74	—	
2	Lowell 4-8-10 Potato Grower	4-8-10	2.64	.35	1.20	4.19	8.74	10.35	—	
9	Lowell 4-8-10 Potato Grower	4-8-10	2.80	.47	1.06	4.33	8.29	9.90	—	
1	Lowell 5-3-5 Tobacco Manure	5-3-5	.26	1.28	3.97	5.51	4.91	—	5.50	
1	Lowell 5-8-7 Market Garden Manure	5-8-7	3.48	.57	1.17	5.22	8.55	7.05	—	
8	Lowell 5-8-7 Market Garden Manure	5-8-7	3.54	.38	1.31	5.23	8.35	7.09	—	
3	Lowell 5-8-10 Banner Brand for Potatoes	5-8-10	3.54	.73	1.06	5.33	8.48	10.08	—	
2	Lowell 7-3-7 High Analysis Tobacco	7-3-7	.18	2.14	4.78	7.10	5.29	—	7.29	
1	Lowell 7-6-6 Top Dressing	7-6-6	6.48	none	.76	7.24	6.50	6.26	—	
7	Lowell 7-6-6 Top Dressing	7-6-6	6.64	none	.48	7.12	6.45	5.62	—	
1	Lowell 7-8-5 Complete Fruit	7-8-5	4.92	.56	1.04	6.52	8.55	5.41	—	
2	Lowell 7-8-5 Complete Fruit	7-8-5	5.12	.65	1.42	7.19	8.10	5.31	—	
Maine Farmers Exchange, Inc.										
6	M. F. E. Produce—More 4-8-4	4-8-4	3.28	.28	.676	4.23	8.29	3.88	—	

1	M. F. E. Produce-More 4-8-7	.	.	.	.	4-8-7	3.36	none	1.03	4.39	8.48	6.98	-
1	M. F. E. Produce-More 5-8-7	.	.	.	.	5-8-7	4.22	none	.80	5.02	8.80	7.29	-
5	M. F. E. Produce-More 5-8-7	.	.	.	.	5-8-7	4.12	none	1.07	5.19	8.54	7.09	-
<b>Miller Fertilizer Co.</b>													
2	Miller's Crop Grower 5-8-7	.	.	.	.	5-8-7	4.26	none	1.14	5.40	8.42	7.09	-
1	Miller's Crop Grower 5-8-7	.	.	.	.	5-8-7	4.12	none	.88b	5.00	8.23	7.21	-
2	Miller's Onion & Vegetable 4-8-4	.	.	.	.	4-8-4	3.20	none	1.13	4.33	8.29	4.03	-
1	Miller's 4-8-10	.	.	.	.	4-8-10	3.22	none	1.46	4.68	8.36	9.63	-
1	Miller's 4-12-4	.	.	.	.	4-12-4	2.72	none	1.18b	3.90	11.16	4.30	-
<b>New England Fertilizer Co.</b>													
1	New England 2-10-2 Corn Phosphate	.	.	.	.	2-10-2	.88	none	1.40	2.28	10.21	2.05	-
3	New England 3-10-4 Super	.	.	.	.	3-10-4	1.68	.71	1.02	3.41	10.01	4.03	-
1	New England 4-8-4 Potato and Vegetable Manure	.	.	.	.	4-8-4	2.58	.43	1.04	4.05	9.06	4.22	-
3	New England 4-8-4 Potato and Vegetable Manure	.	.	.	.	4-8-4	2.82	.45	1.29	4.26	8.36	4.03	-
1	New England 4-8-7 Old General Crop Manure	.	.	.	.	4-8-7	2.66	.47	.94	4.07	8.77	7.02	-
1	New England 4-8-10 Complete Manure	.	.	.	.	4-8-10	2.68	.53	1.12	4.33	8.80	10.31	-
4	New England 4-8-10 Complete Manure	.	.	.	.	4-8-10	2.70	.77	1.01	4.48	8.03	10.15	-
1	New England 5-8-7 Market Garden Manure	.	.	.	.	5-8-7	3.64	.38	1.13	5.15	8.61	7.48	-
7	New England 5-8-7 Market Garden Manure	.	.	.	.	5-8-7	3.44	.52	1.21	5.17	8.16	7.06	-
1	New England 5-8-10 Banner Brand for Potatoes	.	.	.	.	5-8-10	3.82	.61	1.00	5.43	8.74	9.88	-
2	New England 7-6-6 Top Dressing	.	.	.	.	7-6-6	6.80	none	.46	7.26	6.12	5.56	-
1	New England 7-8-5 Complete Fruit	.	.	.	.	7-8-5	5.34	.80	1.18	7.32	8.29	5.19	-
<b>Nitrate Agencies Co.</b>													
2	Naco 7-5-2	.	.	.	.	7-5-2	1.36	.97	5.34	7.67	6.12	2.25	-
<b>Old Deerfield Fertilizer Co., Inc.</b>													
2	Old Deerfield 3-10-6, Corn & Seeding Down	.	.	.	.	3-10-6	1.80	.48	1.52	3.80	12.24	5.34	2.39

b The water insoluble organic nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Old Deerfield Fertilizer Co., Inc. — Concluded.										
2	Old Deerfield 4-6-10 . . . . .	4-6-10	.64	1.18	2.22	4.04	6.57	—	10.12	
1	Old Deerfield 4-8-4, General Crops . . . . .	4-8-4	.124	.85	2.12	4.21	7.65	.99 <sub>a</sub>	3.35	
1	Old Deerfield 4-8-7, Market Garden (muriate) . . . . .	4-8-7	1.22	1.04	1.97	4.23	8.16	3.45	3.86	
3	Old Deerfield 4-8-7, Market Garden (muriate) . . . . .	4-8-7	1.18	.97	2.03	4.18	7.33	3.53	3.64	
1	Old Deerfield 4-8-7, Potato (other than muriate) . . . . .	4-8-7	1.26	1.11	2.02	4.39	7.14	—	7.64	
2	Old Deerfield 4-8-7, Potato (other than muriate) . . . . .	4-8-7	1.68	.91	1.66	4.25	7.33	—	7.21	
1	Old Deerfield 5-3-5, Tobacco . . . . .	5-3-5	.30	.98	4.14	5.42	4.34	—	5.04	
2	Old Deerfield Lawnshrub 5-5-5 . . . . .	5-5-5	1.20	.19	4.63	6.02	6.06	—	5.58	
1	Old Deerfield 5-8-7, Set Onion (muriate) . . . . .	5-8-7	1.28	1.24	2.53	5.05	7.46	7.13	—	
1	Old Deerfield 5-8-7, Set Onion (other than muriate) . . . . .	5-8-7	1.36	1.00	2.81	5.17	8.04	3.61	4.34	
1	Old Deerfield 5-8-7, Set Onion (other than muriate) . . . . .	5-8-7	1.20	.67	3.06	4.93	8.03	6.33	.80	
1	Old Deerfield 5-8-12, Tobacco Starter . . . . .	5-8-12	.24	.99	3.98	5.21	8.48	—	12.94	
3	Old Deerfield 5-8-12, Tobacco Starter . . . . .	5-8-12	.10	1.37	3.81	5.28	8.61	2.96 <sub>a</sub>	10.14	
1	Old Deerfield 6-3-7, Complete Tobacco . . . . .	6-3-7	.38	.86	5.25	6.49	3.57	—	6.84	
1	Old Deerfield 7-6-6, Grass Top Dressing . . . . .	7-6-6	3.14	1.64	2.17	6.95	6.38	5.26	1.48	
2	Old Deerfield 7-6-6, Grass Top Dressing . . . . .	7-6-6	2.98	3.37	1.07	7.42	6.32	6.28	—	
1	Old Deerfield 8-16-14 . . . . .	8-16-14	3.28	1.54	3.36	8.18	16.20	—	15.97	
1	Valley Brand 4-8-4 . . . . .	4-8-4	2.44	.63	1.23	4.30	8.93	3.78	1.06	
2	Valley Brand 4-8-4 . . . . .	4-8-4	2.52	.90	.80	4.22	8.42	4.15	—	
1	Valley Brand 4-8-7 . . . . .	4-8-7	2.58	.92	.78	4.28	8.23	3.94	2.92	
1	Valley Brand 5-8-7 . . . . .	5-8-7	2.68	.92	1.71	5.31	8.29	7.09	—	

Olds & Whipple, Inc.									
1	Luxura 5-8-6	5-8-6	2.84	.99	1.71	5.54	9.50	6.78	-
3	O & W Blue Label Tobacco Fertilizer 6-3-6	6-3-6	.10	.76	5.57	6.43	3.00	-	6.51
1	O & W Complete Tobacco Fertilizer 5-3-5	5-3-5	.18	.91	4.10	5.19	3.95	-	5.66
1	O & W High Grade Potato & Vegetable Fertilizer 5-8-7	5-8-7	3.18	1.04	1.26	5.48	8.80	-	8.02
1	O & W High Grade Potato & Vegetable Fertilizer 5-8-7	5-8-7	3.26	1.02	1.39	5.67	9.25	7.25	-
2	O & W High Grade Tobacco Starter & Potash Compound 5-4-15	5-4-15	.78	1.46	2.96	5.20	4.91	-	17.28
1	O & W High Grade Tobacco Starter & Potash Compound 5-4-15	5-4-15	.84	1.34	2.96	5.14	4.91	-	16.70
2	O & W Market Garden Fertilizer 4-8-4	4-8-4	2.56	.98	.75	4.29	8.87	4.65	-
4	O & W Market Garden Fertilizer 4-8-4	4-8-4	2.44	1.11	.95	4.50	8.55	4.19	-
1	O & W Top Dressing & Grass Fertilizer 7-6-6	7-6-6	2.74	.88	3.47	7.09	6.89	6.47	-
1	Wilcox Market Garden 4-8-4	4-8-4	2.78	.89	.90	4.57	8.61	4.07	-
1	Wilcox Potato & General Purpose 4-8-7	4-8-7	1.94	.91	1.44	4.29	8.29	7.25	-
1	J. W. Alsop, Inc., Special Tobacco Formula 4-1-8	4-1-8	.22	1.61	3.15	4.98	1.65	-	9.71
Parmenter & Polsey Fertilizer Co.									
7	"P & P" 3 10 4 Plymouth Rock Brand for All Crops	3-10-4	1.70	.60	1.07	3.37	10.34	4.07	-
1	"P & P" 4 8 4 Corn & Vegetable Fertilizer	4-8-4	2.32	.39	1.33	4.04	10.26	4.80	-
5	"P & P" 4 8 4 Corn & Vegetable Fertilizer	4-8-4	2.64	.64	1.08	4.36	8.61	4.07	-
4	"P & P" 4-8-10 Maine Potato Fertilizer	4-8-10	2.66	.69	1.15	4.50	8.41	10.16	-
1	Parmenter & Polsey 5-8-7 Potato & Vegetable	5-8-7	3.36	.55	1.17	5.08	8.55	7.09	-
3	Parmenter & Polsey 5-8-7 Potato & Vegetable	5-8-7	3.48	.63	1.14	5.25	8.41	7.09	-
1	"P & P" 5-8-10 Banner Brand for Potatoes	5-8-10	3.66	.46	1.16	5.28	8.68	10.25	-
2	"P & P" 5-8-10 Banner Brand for Potatoes	5-8-10	3.70	.52	1.05	5.27	8.67	10.23	-
3	Parmenter & Polsey 7-6-6 Top Dressing	7-6-6	6.70	none	.62	7.32	6.63	6.05	-
Pawtucket Rendering Co.									
1	Pawtucket 3-10-4	3-10-4	1.74	.47	1.39	3.60	10.27	4.34	-

a The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.



## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Pawtucket Rendering Co.—Concluded.										
1	Pawtucket 4-8-4 Brand	4-8-4	2.56	.50	1.33	4.39	8.93	4.73	—	
3	Pawtucket 4-8-4 Brand	4-8-4	2.70	.52	1.19	4.41	8.04	4.03	—	
1	Pawtucket 5-8-7 Brand	5-8-7	3.54	.54	1.13	5.21	8.35	7.33	—	
2	Pawtucket 5-8-7 Brand	5-8-7	3.64	.23	1.23	5.10	8.48	7.87	—	
Pedigreed Seed Co., Inc.										
1	Laguna Special Turf Fertilizer 5-8-6	5-8-6	3.76	none	1.79	5.55	6.76	7.23	.64	
Fred G. Phillips										
1	Ferti-Flora (old stock)	3¼-3½-3⅞	1.36	2.32	.14	3.82	3.83	1.40	2.48	
Piedmont-Mt. Airy Guano Co.										
2	Harvest Brand 2-8-2	2-8-2	1.64	none	.93	2.57	8.03	2.25	—	
4	Harvest Brand 3-8-4	3-8-4	2.44	none	.90	3.34	8.16	4.26	—	
2	Harvest Brand 4-6-10	4-6-10	3.64	.19	.58	4.41	6.76	10.50	—	
2	Harvest Brand 4-8-4	4-8-4	3.20	none	1.12	4.32	8.67	4.34	—	
2	Harvest Brand 4-8-4	4-8-4	3.42	none	.86	4.28	8.10	4.57	—	
2	Harvest Brand 5-8-7	5-8-7	4.20	none	1.24	5.44	8.29	7.17	—	
1	Harvest Brand 5-8-7	5-8-7	3.74	none	1.01b	4.75	8.23	7.67	—	
Plantabbs Corp.										
1	Fulton's Plantabbs 11-15-20	11-15-20	3.74	7.55	.04	11.33	18.50	—	25.24	

Rogers & Hubbard Co.

[illegible]

<sup>a</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.  
<sup>b</sup> The water insoluble organic nitrogen was of inferior quality.

*a* The presence of small amounts of chlorine may be due to impurities in the starting materials.  
*b* The water insoluble organic nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Rogers & Hubbard Co. — Concluded.										
1	Portland Brand 4-6-10 Fertilizer	4-6-10	3.26	none	.91	4.17	6.95	10.47	—	
1	Portland Brand 4-8-4 Fertilizer	4-8-4	3.52	none	.74	4.26	8.29	5.10	—	
10	Portland Brand 4-8-4 Fertilizer	4-8-4	3.70	none	.59	4.29	8.17	4.07	—	
3	Portland Brand 4-8-7 Fertilizer	4-8-7	3.08	none	1.04	4.12	8.74	7.17	—	
1	Portland Brand 4-8-10 Fertilizer	4-8-10	3.12	none	1.26	4.38	8.04	10.54	—	
7	Portland Brand 5-8-7 Fertilizer	5-8-7	4.58	none	.59	5.17	8.10	7.36	—	
1	Portland Brand 5-8-7 Fertilizer	5-8-7	4.50	none	.95	5.45	8.03	7.95	—	
2	Portland Brand 5-8-7 Fertilizer	5-8-7	4.36	none	1.16	5.52	8.42	7.44	—	
1	Portland Brand 5-8-7 Fertilizer	5-8-7	4.32	none	.90	5.22	7.72	7.09	—	
1	Portland Brand 7-6-6 Fertilizer	7-6-6	5.38	.51	1.61	7.50	6.57	6.20	—	
5	Portland Brand 7-6-6 Fertilizer	7-6-6	6.02	none	1.33	7.35	6.38	5.70	—	
F. S. Royster Guano Co.										
1	Royster Connecticut Tobacco Guano 5-3-5	5-3-5	.18	1.02	3.68	4.88	3.44	—	5.27	
2	Royster Quality Trucker 4-8-7	4-8-7	3.40	none	.75	4.15	8.29	7.13	—	
1	Royster 5% Truck Guano 5-8-7	5-8-7	4.30	none	.76	5.06	8.80	7.17	—	
1	Royster Truckers Delight 4-8-4	4-8-4	3.22	none	.89	4.11	8.29	4.11	—	
1	Royster Wrapper Brand 7-3-7	7-3-7	.20	1.24	5.46	6.90	4.08	—	7.56	
Salem Chemical & Supply Co.										
1	Plant Food (old stock)	2-5-3, 5-3	2.50	none	.45	2.95	4.46	3.01	—	
2	Plant Food (old stock)	2-5-3, 5-3	2.44	none	.11	2.55	3.44	3.53	—	

[illegible]

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid—Potash.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Standard Wholesale Phosphate & Acid Works, Inc.										
—Concluded										
1	Standard United States 5 x 8 x 5	5-8-5	4.32	none	.78	5.10	8.80	5.08	—	
5	Standard United States 5 x 8 x 7	5-8-7	4.40	none	.73	5.13	8.16	7.17	—	
4	Standard United States 5 x 8 x 7	5-8-7	4.40	none	.68	5.08	8.10	7.09	—	
1	Standard United States 8 x 6 x 6	8-6-6	5.32	none	2.96	8.28	6.25	6.82	—	
1	Standard United States 8 x 6 x 6	8-6-6	7.40	none	.62	8.02	6.57	6.36	—	
Stimuplant Laboratories, Inc.										
3	Stimuplant (Tablets) 11-12-15	11-12-15	2.56	8.22	.06	10.84	13.78	18.18	—	
Sutton & Sons, Ltd.										
1	Sutton's Simplex Fertilizer	4.5-4.12-15	1.32	none	4.83	6.15	4.72	.31	—	
Swift & Co., Fertilizer Works										
3	Vigoro 4-12-4	4-12-4	3.16	.31	.70	4.17	12.63	4.34	—	
4	Vigoro 4-12-4	4-12-4	3.14	.33	.54	4.01	12.50	4.22	—	
Arthur F. Sylvester										
3	Dove Brand Fertilizer	4-6-3	3.08	.15	1.57	4.80	7.40	3.91	—	
Synthetic Nitrogen Products Corp.										
1	Nitrophoska 15-30-15	15-30-15	13.28	1.31	.47	15.06	31.68	14.38	—	
4	Nitrophoska 15-30-15	15-30-15	12.82	2.07	.49	15.38	30.62	14.18	—	
1	Nitrophoska 15-30-15	15-80-15	12.46	2.21	.51	15.18	30.23	15.04	—	
3	Nitrophoska 15-30-15	15-30-15	12.60	2.05	.61	15.26	29.34	14.66	—	

Tennessee Corp.									
4	Loma (5-10-4)	.	.	.	.	.	.	.	.
3	Loma (5-10-4)	.	.	.	.	.	.	.	.
		5-10-4	4.14	.45	.45	5.04	10.46	4.26	-
		5-10-4	4.36	.20	.61	5.17	11.03	4.01	-
Victory Fertilizer Corp.									
2	Victory Lawn & Garden Fertilizer 4-8-4	.	3.46	none	.94	4.40	9.63	4.03	-
1	Victory Plant Food 3-8-4	.	4.58	none	.96	5.54	10.65	5.56	-
Virginia-Carolina Chemical Corp., New York, N. Y.									
1	V-C Aroostook Potato Grower 5-8-7	.	3.76	none	1.46	5.22	7.84	7.36	-
2	V-C Aroostook Potato Grower 5-8-7	.	3.60	.18	1.31	5.09	8.42	7.05	-
1	V-C Double Owl Brand 4-8-7	.	3.32	.17	.73	4.22	8.04	7.83	-
1	V-C Good Luck Fertilizer 3-12-6	.	2.56	none	.58	3.14	12.18	6.51	-
1	V-C Indian Chief Brand 5-3-5	.	1.20	.61	3.43	5.24	3.95	-	5.31
1	V-C National Brand 4-8-10	.	3.70	none	.68	4.38	8.22	10.04	-
1	V-C National Brand 4-8-10	.	3.68	.24	.51	4.43	8.10	10.47	-
1	V-C Owl Brand Fertilizer 2-12-4	.	1.84	none	.74	2.58	12.05	4.73	-
1	V-C Owl Brand Fertilizer 2-12-4	.	1.84	none	.76	2.60	12.24	4.15	-
1	V-C Super Thirty 6-18-6	.	5.44	none	.85	6.29	18.12	6.16	-
1	V-C Super Forty 10-16-14	.	8.20	none	1.83	10.03	15.95	14.34	-
1	V-C Tip-Top Top Dresser 7-6-6	.	6.12	none	.99	7.11	6.50	6.47	-
1	V-C Tip-Top Top Dresser 7-6-6	.	5.88	.28	.84	7.00	6.31	6.55	-
1	V-C XXXX Fish & Potash 4-8-4	.	3.56	none	.68	4.24	8.36	4.34	-
2	V-C XXXX Fish & Potash 4-8-4	.	3.36	.13	.66	4.15	8.03	4.34	-
Virginia-Carolina Chemical Corp., Richmond, Va.									
1	Bloom Aid 5-10-4	.	2.58	1.31	1.49	5.38	10.66	-	4.38
2	Bloom Aid, Tablet Form (old stock)	.	9.40	none	.58	9.98	14.48	-	6.43
1	Bloom Aid (Liquid Form) (old stock)	.	1.04	.95	-	1.99	2.81	-	1.36
1	V-C Fairway Fertilizer (old stock)	.	4.46	.20	2.41	7.07	6.70	5.66	-





## CHEMICALS AND RAW PRODUCTS

Summary of Results of the Inspection of Fertilizer Samples and Raw Products.

MATERIAL.	Number of Samples Collected.	Number of Analyses Made.	Average Percentage of Nitrogen.	Average Percentage of Total Phosphoric Acid.	Average Percentage of Available Phosphoric Acid.	Average Percentage of Water Soluble Potash.	Average Selling Price Per Ton.	Average Commercial Valuation Per Ton.	Cost of One Pound of Plant Food (Cents).
Nitrate of soda . . .	75	16	16.08	-	-	-	\$43.73	\$45.02	13.6 (nitrogen)
Nitrate of potash . . .	10	7	13.29	-	-	44.58 <sup>a</sup>	75.75	72.87	15.08 (nitrogen) 4.0 (potash)
Nitrate of lime . . .	4	1	15.74	-	-	-	42.79	44.07	13.6 (nitrogen)
Cal-Nitro . . .	1	1	16.16	-	-	-	44.00	45.25	13.6 (nitrogen)
Ammonium sulfate . . .	57	15	20.85	-	-	-	32.59	31.28	7.8 (nitrogen)
Calurea . . .	3	2	34.08	-	-	-	83.00	74.98	12.2 (nitrogen)
Synthetic urea . . .	5	1	46.02	-	-	-	86.80	101.20	9.4 (nitrogen)
Cyanamid . . .	7	2	22.33	-	-	-	42.26	42.43	9.5 (nitrogen)
Ammo-Phos A . . .	3	3	11.16	48.98	48.41	-	72.16	64.17	11.1 (nitrogen) 4.9 (available phosphoric acid)
Ammo-Phos B . . .	1	1	16.58	22.00	21.94	-	-	46.28	-
Cottonseed meal . . .	127	127	6.67	3.44	-	2.13 <sup>b</sup>	23.67	23.35	17.7 (nitrogen)
Linseed meal . . .	3	3	6.25	2.04	-	1.42 <sup>b</sup>	35.20	21.88	28.2 (nitrogen)
Castor pomace . . .	18	18	5.24	1.79	-	1.12 <sup>b</sup>	27.53	18.34	26.3 (nitrogen)
Blood tankage . . .	5	5	11.93	3.63	-	-	51.61	35.48	20.3 (nitrogen)
Milorganite . . .	2	1	6.28	2.81	-	-	33.33	19.21	24.7 (nitrogen)
Superphosphate 16 % . . .	91	17	-	17.84	16.70	-	14.74	16.74	4.4 (available phosphoric acid)
Superphosphate 18 % . . .	2	1	-	19.64	19.19	-	21.36	18.89	5.6 (available phosphoric acid)
Superphosphate 20 % . . .	1	1	-	20.28	20.09	-	-	19.67	-
Double superphosphate 32 % . . .	5	1	-	32.02	32.02	-	31.26	31.22	4.9 (available phosphoric acid)
Precipitated bone . . .	7	6	-	40.33	39.39	-	50.07	38.79	6.4 (available phosphoric acid)
Basic slag phosphate . . .	6	2	-	17.86	16.11	-	24.67	16.41	7.7 (available phosphoric acid)
Muriate of potash . . .	48	12	-	-	-	50.22	40.57	44.19	4.0 (potash)
High grade sulfate of potash . . .	19	9	-	-	-	49.38	55.65	58.27	5.6 (potash)
Potash-magnesia sulfate . . .	2	2	-	-	-	28.73	-	33.90 <sup>c</sup>	-
Cotton hull ashes . . .	4	4	-	2.00	-	27.63	60.00	43.05 <sup>d</sup>	10.6 (potash)
Dry ground fish . . .	31	15	9.49	7.36	-	-	63.51	60.71	30.0 (nitrogen)
Tankage (e) . . .	45	16	9.89	8.06	-	-	31.18	29.08	12.3 (nitrogen)
Ground bone (f) . . .	102	34	2.94	23.27	-	-	37.37	27.52	-
Wood ashes (g) . . .	3	3	-	1.90	-	4.87	-	14.47	-
Ground tobacco stems . . .	5	3	1.38	.63	-	4.09 <sup>b</sup>	17.40	8.50	-
Pulverized sheep manure (h) . . .	34	8	1.50	1.10	-	3.35 <sup>b</sup>	47.34	6.34	-
Pulverized sheep and goat manure (h) . . .	24	3	1.42	1.19	-	3.23 <sup>b</sup>	39.15	6.16	-
Pulverized goat manure (h) . . .	9	3	1.67	1.05	-	2.82 <sup>b</sup>	33.66	6.19	-
Pulverized cattle manure (h) . . .	15	5	1.84	1.07	-	2.07 <sup>b</sup>	82.89	5.92	-
Pulverized poultry manure (h) . . .	8	1	5.02	2.68	-	1.01 <sup>b</sup>	54.27	12.24	-
Poultry manure and peat (h) . . .	6	1	2.91	2.64	-	1.25 <sup>b</sup>	79.14	8.49	-
Sheep manure and wool waste (h) . . .	5	2	2.25	.53	-	5.12 <sup>b</sup>	17.88	8.68	-

a Average chlorine, 1.71 %.

b Total potash.

c Average magnesium oxide, 9.21 %.

d Average calcium oxide, 12.62 %; magnesium oxide, 5.13 %; chlorine, 1.35 %; water, 7.35 %, insoluble matter, 11.68 %.

e Average tankage finer than 1-50 inch diameter, 44.63 %; coarser than 1-50 inch, 55.37 %.

f Average bone finer than 1-50 inch diameter, 69.35 %; coarser than 1-50 inch, 30.65 %.

g Average calcium oxide, 31.83 %; magnesium oxide, 3.59 %; insoluble matter, 14.40 %; water, 15.16 %.

h Average organic matter: sheep manure, 45.26 %; sheep and goat manure, 37.63 %; goat manure, 35.07 %; cattle manure, 78.18 %; poultry manure, 69.38 %; poultry manure and peat, 67.18 %; sheep manure and wool waste, 47.75 %.

### Nitrogen Compounds.

The chemicals and unmixed materials under this heading are valued chiefly for the nitrogen which they contain. Some of them, however, contain more than this one element: the nitrate of potash containing potash; the calcium nitrate and cyanamid containing lime; and the organic vegetable substances containing small quantities of phosphoric acid and potash, as will be noticed by a reference to the summary table on the previous page.

Brands showing a commercial shortage of one dollar or more per ton follow the appropriate table, but are listed by themselves, serious deficiencies therein being emphasized by boldface type.

#### Nitrate of Soda and Sulfate of Ammonia.

MANUFACTURER.	NITRATE OF SODA.			SULFATE OF AMMONIA.		
	Number of Samples.	NITROGEN.		Number of Samples.	NITROGEN.	
		Found.	Guaranteed.		Found.	Guaranteed.
American Agricultural Chemical Co.	{ 1	16.16	15.50	7	20.92	20.56
	{ 1	16.24	15.50			
Apothecaries Hall Co. . . . .	1	16.02	16.00	3	20.70	20.50
Armour Fertilizer Works . . . .				1	20.68	20.50
Barrett Co. . . . .	{ 13	16.26	16.00	3	21.06	20.56
	{ 1	16.10	16.00	4	21.04	20.56
	{ 16	16.06	16.00			
	{ 1	16.18	16.00			
Berkshire Chemical Co. . . . .				1	21.08	20.56
Chilean Nitrate Sales Corp. . . .	{ 21a	16.10	16.00			
	{ 1a	16.04	16.00			
	{ 1a	16.28	16.00			
	{ 1a	16.02	16.00			
	{ 6b	15.38	15.25			
	{ 2b	15.76	14.80			
Consolidated Rendering Co. . . .				{ 1	20.52	20.50
				{ 11	20.78	20.50
				{ 3	20.50	20.50
				{ 7	20.94	20.50
Eastern States Farmers' Exchange .				{ 2	20.92	20.80
Ford Motor Co. . . . .				{ 2	20.80	20.56
International Agricultural Corp. .	1	16.08	15.00			
Merrimac Chemical Co. . . . .	3	16.30	16.25			
Koppers Products Co. . . . .				6	20.98	20.75
Old Deerfield Fertilizer Co., Inc. .				1	20.94	20.50
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	5	16.06	16.00			
C. P. Washburn Co. . . . .				5	20.98	20.50

a Champion brand.

b Standard brand.

#### Nitrate of Potash.

MANUFACTURER.	Number of Samples.	NITROGEN.		POTASSIUM OXIDE.		Chlor- ine
		Found.	Guaran- teed.	Found.	Guaran- teed.	
American Agricultural Chemical Co.	1	13.52	13.00	43.68	44.00	2.66
Apothecaries Hall Co.	1	13.66	13.00	45.52	44.00	1.24
Eastern States Farmers' Exchange	4	13.16	13.00	44.36	44.00	2.72
International Agricultural Corp.	1	13.28	13.16	45.12	44.00	1.48
Old Deerfield Fertilizer Co., Inc.	{ 1	13.32	13.00	45.32	44.00	.49
	{ 1	13.12	13.00	44.20	44.00	.74
Rogers & Hubbard Co.	1	13.28	13.00	45.12	44.00	.59

## Calcium Nitrate, Cal-Nitro, Calurea, Urea and Calcium Cyanamid.

MANUFACTURER.	BRAND.	Number of Samples.	NITROGEN.	
			Found.	Guaranteed.
American Cyanamid Co. . . . .	{ Aero Cyanamid	6	22.34	22.00
	{ Aero Cyanamid powder-	1	22.00	22.00
	ed . . . . .	1	34.06	34.00
Eastern States Farmers' Exchange .	Calurea . . . . .	2	34.08	34.00
	Calurea . . . . .	1	46.02	46.00
	Urea . . . . .	2	46.00	46.00
Synthetic Nitrogen Products Corp. .	Urea . . . . .	4	15.74	15.00
	Calcium Nitrate . . . . .	1	16.10	16.00
	Cal-Nitro . . . . .	1	46.12	46.00
	Urea, Floranid . . . . .	1	46.44	46.00
Foodndrink Co. (W. W. Waidelich) .	Urea, Floranid . . . . .	2	13.88	13.00
	Foodndrink (a) . . . . .			

a Urea in cartridge form, for hose attachment.

## Cottonseed Meal and Castor Pomace.

MANUFACTURER.	COTTONSEED MEAL.			CASTOR POMACE.		
	Number of Analyses.	NITROGEN.		Number of Analyses.	NITROGEN.	
		Found.	Guaranteed.		Found.	Guaranteed.
American Agricultural Chemical Co.				5	5.18	4.53
Apothecaries Hall Co. . . . .	1	6.71	6.58	3	5.18	4.52
Armour Fertilizer Works . . . . .				1	5.01	4.52
Ashcraft-Wilkinson Co. . . . .	{ 17	6.66	6.56			
	{ 1	7.19	6.88			
Baker Castor Oil Co. . . . .				1	5.59	4.50
Berkshire Chemical Co. . . . .				5	5.21	4.52
F. W. Brode Corp. . . . .	5	6.76	6.56			
Cairo Meal & Cake Co. . . . .	5	6.54	6.56			
Humphreys-Godwin Co. . . . .	{ 5	7.05	6.87			
	{ 78	6.70	6.56			
International Agricultural Corp. .	1	6.60	6.58			
L. B. Lovitt & Co. . . . .	13	6.66	6.56			
Old Deerfield Fertilizer Co., Inc. .				1	4.89	5.00
Olds & Whipple Co. . . . .				2	5.07	4.50

**Warning.** Dealers and distributors of cottonseed meal sold as a fertilizer in Massachusetts should, before making contracts or purchases for resale, make inquiry at the fertilizer control laboratory as to whether or not the southern shipper has complied with the Massachusetts fertilizer law by registration of his brands. Registration and tonnage fees, if not paid by the shipper, must be collected from the local distributor.

## Old Process Linseed Meal, Dried Blood and Milorganite.

MANUFACTURER.	BRAND.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.	
			Found.	Guaranteed.	Found.	Guaranteed.
Consolidated Rendering Co.	Blood Tankage	1	13.24	9.87	.51	—
Milwaukee Sewerage Commission	Milorganite	2	6.28	5.00 <sup>a</sup>	2.81	2.75
New England Dressed Meat & Wool Co.	Dried Blood	1	12.93	11.93	.32	—
New England Rendering Co.	Dried Blood	1	11.53	11.51	2.04	—
Old Deerfield Fertilizer Co., Inc.	Blood Tankage	1	10.49	11.00	8.68	5.00
John Reardon & Sons Co.	Dried Blood	1	11.72	12.34	1.59	—
Spencer Kellogg & Sons, Inc.	Old Process Linseed Meal	3	6.25	5.92	—	—

## Commercial Peat Products.

MANUFACTURER OR IMPORTER.	BRAND.	Water.	Organic Matter.	Mineral Matter.	NITROGEN.	
					Found.	Guaranteed.
American Soil Sponge	Dry Ground Peat	46.01	47.20	6.79	.92	.50
Selling Corp.	Dry Ground Peat	43.48	53.30	3.32	.97	.50
Atkins & Durbrow, Inc.	Granulated Peat Moss	13.15	83.80	3.05	.93	.24
	Sorbex	16.98	81.03	1.99	.93	.24
Brague, Inc.	Soil-Co Leaf Mold	61.41	34.05	4.54	.59	.50
	Soil-Co Leaf Mold	60.27	32.61	7.12	.32	.50
	Soil-Co Leaf Mold	61.41	33.98	4.61	.57	.50
C. E. Buell, Inc.	Buell-Boston Ground Peat (a)	14.27	78.00	7.73	1.34	.75
Curley Brothers	Crystal Peat Moss	12.85	84.35	2.80	.92	.50
Hyper-Humus Co.	Hyper-Humus	59.92	36.03	4.05	1.16	.50
Maplevale Leafmold Co.	Maplevale Leafmold	54.81	35.05	10.14	.97	.25
	Maplevale Leafmold	57.90	35.44	6.66	.72	.25
	Maplevale Leafmold	57.90	29.63	12.47	.66	.25
Victory Fertilizer Corp.	Victory Humus	48.70	19.61	31.69	.91	.50

<sup>a</sup> Five samples.

**Phosphoric Acid Compounds.**

The following table gives the analyses of those fertilizer products valued chiefly for their available phosphoric acid.

**Superphosphate, Precipitated Bone and Basic Slag Phosphate.**

MANUFACTURER.	BRAND.	Num- ber of Sam- ples.	Total Phos- phoric Acid.	AVAILABLE PHOSPHORIC ACID.	
				Found.	Guaran- teed.
Allied Mills, Inc. . . . .	16 % Superphosphate . . . . .	1	17.22	16.90	16.00
American Agricultural	{ 16 % Superphosphate . . . . .	11	17.67	17.10	16.00
Chemical Co. . . . .	{ Co-Op Superphosphate . . . . .	5	16.97	16.14	16.00
Apothecaries Hall Co. . . . .	{ 16 % Superphosphate . . . . .	2	17.48	16.91	16.00
	{ Precipitated Bone . . . . .	2	39.04	37.13	36.00
Armour Fertilizer Works . . . . .	{ 16 % Superphosphate . . . . .	4	17.09	16.52	16.00
	{ 20 % Superphosphate . . . . .	1	20.28	20.09	20.00
	{ Basic Slag Phosphate . . . . .	1	17.86	16.71	14.40
Berkshire Chemical Co. . . . .	{ 16 % Superphosphate . . . . .	3	17.48	17.03	16.00
	{ Precipitated Bone Phosphate . . . . .	1	39.04	38.72	38.00
Consolidated Rendering Co. . . . .	{ 16 % Superphosphate . . . . .	1	18.04	17.40	16.00
	{ 16 % Superphosphate . . . . .	14	17.98	16.70	16.00
	{ 16 % Superphosphate . . . . .	12	17.60	16.90	16.00
John C. Dow Co., Inc. . . . .	{ Precipitated Bone . . . . .	1	40.06	39.17	36.00
Eastern States Farmers'	{ 16 % Superphosphate . . . . .	9	17.35	16.84	16.00
Exchange . . . . .	{ 32 % Double Superphosphate . . . . .	5	32.02	32.02	32.00
	{ Precipitated Bone . . . . .	1	40.18	38.78	38.00
	{ Basic Slag Phosphate . . . . .	1	18.24	15.05	14.40
International Agricultural	{ 16 % Superphosphate . . . . .	9	16.97	16.33	16.00
Corp. . . . .	{ 18 % Superphosphate . . . . .	2	19.64	19.19	18.00
	{ Basic Slag Phosphate . . . . .	4	17.86	15.24	14.40
Old Deerfield Fertilizer Co.,	{ 16 % Superphosphate . . . . .	1	17.22	16.90	16.00
Inc. . . . .	{ Precipitated Bone . . . . .	1	42.60	42.22	40.00
	{ Precipitated Bone . . . . .	1	42.76	42.12	38.00
Piedmont-Mt. Airy Guano					
Co., Inc. . . . .	16 % Superphosphate . . . . .	1	16.58	16.01	16.00
Rogers & Hubbard Co. . . . .	16 % Superphosphate . . . . .	9	16.97	16.33	16.00
Standard Wholesale Phos- phate & Acid Works, Inc.	16 % Superphosphate . . . . .	4	16.58	16.01	16.00
Virginia-Carolina Chemical					
Corp. . . . .	16 % Superphosphate . . . . .	1	18.11	16.77	16.00
C. P. Washburn Co. . . . .	16 % Superphosphate . . . . .	3	17.86	17.16	16.00

**Potash Compounds.**

The tables under this heading give the composition of those fertilizer products valued chiefly for their potash.

**Sulfate of Potash-Magnesia.**

MANUFACTURER.	Number of Samples.	POTASH.		Magne- sium Oxide	Chlorine.
		Found.	Guaran- teed.		
Apothecaries Hall Co. . . . .	1	28.56	26.00	9.31	2.12
Old Deerfield Fertilizer Co., Inc. . . . .	1	28.80	25.00	9.17	1.68

## Cotton Hull Ashes.

MANUFACTURER.	Number of Samples.	PHOSPHORIC ACID.		POTASH		Calcium Oxide.	Magnesium Oxide.	Chlorine	Insoluble Matter.
		Found.	Guaranteed.	Found.	Guaranteed.				
Eastern States Farmers' Exchange	1	2.04	2.50	25.28	25.00			1.43	
Old Deerfield Fertilizer Co., Inc.	1	2.42	1.00	25.28	25.00	14.08	5.87	1.85	13.05
Olds & Whipple, Inc.	1	1.94	trace	24.80	20.00			1.29	

## Muriate and High Grade Sulfate of Potash.

MANUFACTURER.	MURIATE OF POTASH.			HIGH GRADE SULFATE OF POTASH.			
	Number of Samples.	POTASH.		Number of Samples.	POTASH.		Chlorine.
		Found.	Guaranteed.		Found.	Guaranteed.	
American Agricultural Chemical Co.	6	50.00	50.00	2	48.52	48.00	2.35
Apothecaries Hall Co.				2	49.24	48.00	2.44
Consolidated Rendering Co.	2	50.23	50.00	1	49.38	50.00	1.76
	9	50.32	50.00				
	4	49.92	50.00				
	4	50.56	50.00				
Eastern States Farmers' Exchange	9	50.16	50.00	1	50.32	50.00	2.19
				1	50.16	48.00	2.21
International Agricultural Corp.	3	50.78	48.00				
N. V. Potash Export My., Inc.	7	50.48	48.00	8	49.76	48.00	1.62
	1	49.52	48.00				
Old Deerfield Fertilizer Co., Inc.	1	61.48	60.00				
Pawtucket Rendering Co.	1	51.56	50.00				
Standard Wholesale Phosphate & Acid Works, Inc.	1	50.64	48.00				

## BRANDS SHOWING A COMMERCIAL SHORTAGE OF \$1 OR MORE PER TON.

Consolidated Rendering Co.	1a	43.32	50.00	1.90
	1b	48.76	50.00	3.06
	2c	48.68	50.00	2.87

The commercial shortages per ton were as follows: (a) \$7.88, (b) \$1.46, (c) \$1.56.

Note: (a) contained 3.73% magnesium oxide, which would indicate that some of the sacks sampled were potash-magnesia sulfate which through error had been labeled sulfate of potash.

## Products Supplying Nitrogen and Phosphoric Acid.

## Dry Ground Fish.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		Chlorine.
		Found.	Guaranteed.	Found.	Guaranteed.	
American Agricultural Chemical Co.	{ 1	9.00	9.00	8.55	6.00	.19
	{ 2	8.93	9.00	8.55	6.00	.04
Apothecaries Hall Co. . . . .	{ 1	9.09	8.22	7.40	5.00	.26
	{ 3	9.03	8.22	8.29	5.00	.04
Berkshire Chemical Co. . . . .	{ 1	9.57	9.04	7.53	6.00	.28
	{ 2	9.69	9.04	7.78	6.00	.23
	{ 4	9.40	9.04	7.27	6.00	.06
Consolidated Rendering Co. . . . .	1a	7.73	7.00	6.51	6.00	7.02
Eastern States Farmers' Exchange	1	9.04	9.00	6.89	6.00	.62
International Agricultural Corp. . .	{ 3	10.19	10.50	5.36	4.50	2.92
	{ 2b	8.05	8.20	4.85	3.70	9.44
Old Deerfield Fertilizer Co., Inc. .	2	9.58	9.05	7.78	5.00	.06
Olds & Whipple, Inc. . . . .	{ 1	9.60	9.00	7.91	5.00	.25
	{ 3	9.63	9.00	7.65	5.00	.04
Rogers & Hubbard Co. . . . .	4	9.02	9.00	7.65	6.00	.10

a Fish Tankage.

b 1931 stock.

## Ammono-Phos.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		
		Found.	Guaranteed.	Total.	AVAILABLE.	
					Found.	Guaranteed.
American Cyanamid Co. . . . .	{ 1	11.28	11.00	50.00	49.24	48.00
	{ 1	11.16	11.00	48.86	48.34	48.00
	1a	11.08	11.00	49.80	48.72	46.00
	1	16.58	16.00	22.00	21.94	20.00

a 1931 stock.



## Animal Tankage.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1-50 Inch.	Coarser than 1-50 Inch.
Armour Fertilizer Works	1	7.23	7.00	7.33	3.00	61.80	38.20
Consolidated Rendering Co	8	8.22	7.41	9.18	9.15	39.71	60.29
	4a	8.59	8.22	9.06	9.00	37.88	62.12
	4b	7.92	6.00	7.65	7.25	44.88	55.12
	2c	7.73	6.00	9.44	7.25	24.93	75.07
Eastern States Farmers' Exchange	2	7.89	7.50	8.36	9.60	51.00	49.00
International Agricultural Corp.	3	7.73	7.40	9.95	9.15	23.93	76.07
Lowell Fertilizer Co.	1	10.43	10.50	7.36	6.86	44.80	55.20
	13	10.51	10.50	7.14	6.86	46.70	53.30
	1	9.84	10.50	8.42	6.86	35.60	64.40
Old Deerfield Fertilizer Co. Inc.	1	10.43	9.00	7.65	5.00	31.88	68.12
Rogers & Hubbard Co.	1	7.58	7.40	13.78	9.15	53.50	46.50
N. Roy & Son	1	8.02	7.00	10.72	8.00	59.70	40.30
Woodard Bros.	1	4.97	4.50	20.15	18.00	33.50	66.50

## BRANDS SHOWING A COMMERCIAL SHORTAGE OF \$1 OR MORE PER TON.

Associated Chemical Co.	1d	6.88	7.00	5.68	4.50	54.41	45.59
Standard Wholesale Phosphate & Acid Works, Inc.	1e	6.70	7.00	3.57	7.15	33.24	66.76

(a) Fat 9.92%, (b) fat 14.25%, (c) fat 12.63%. Apparently these samples were meat scraps diverted from feeding channels.

d The product analyzed 4.53% available phosphoric acid, of which .77% was soluble in water, indicating the presence of superphosphate. It also analyzed 1.54% ammoniacal nitrogen and 4.94%  $\text{SO}_3$ , which indicates that ammonium sulfate was added at the rate of 150 pounds per ton. Microscopical examination revealed the presence of fragments of coconut shells, watermelon, apple, tomato and cucumber seeds, apple skins, bran coats from wheat, and glass, indicating that the product was a mixture of garbage tankage, animal tankage, ammonium sulfate and superphosphate. There was 1.94% of potassium oxide present, which evidently originated in the organic vegetable matter in the garbage tankage. The product showed a commercial shortage of \$3.00 per ton, and a rebate of \$4.30 per ton was promptly paid by the manufacturer. Only one-half ton of the product was sold in the state. The manufacturer was advised that such a mixture could not legally be sold in Massachusetts as animal tankage.

e There was a commercial shortage of \$3.64 per ton. Only three sacks were sold, and this apparently was stock carried over from the previous season. Both chemical and microscopical examination indicated that the product was a mixture of animal tankage and processed tankage. The manufacturer was advised that such a product, although of fairly good quality, should not be sold as animal tankage but as a mixture of animal and processed tankage.

## Ground Bone.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1-50 inch.	Coarser than 1-50 inch.
American Agricultural Chemical Co.	{ 9	2.61	2.47	24.24	22.88	79.64	20.36
Apothecaries Hall Co.	{ 1	2.75	2.47	23.22	22.88	73.18	26.82
	{ 1	2.57	2.47	24.36	22.00	86.95	13.05
	{ 2	3.91	3.29	19.39	20.00	72.90	27.10
	{ 1	4.27	3.29	19.52	20.00	62.50	37.50
Armour Fertilizer Works	5	3.06	2.47	22.96	22.00	78.55	21.45
Associated Chemical Co.	{ 3	2.98	2.47	25.77	23.00	55.22	44.78
	{ 1	3.83	3.70	20.41	20.00	16.10	83.90
Berkshire Chemical Co.	1	2.61	2.47	24.75	20.00	65.14	34.86
Joseph Breck & Sons Corp.	1	2.77	2.47	21.56	22.50	66.08	33.92
Consolidated Rendering Co.	{ 9	2.63	2.05	24.24	22.90	69.70	30.30
	{ 1	3.43	2.05	23.22	22.90	66.30	33.70
John C. Dow Co., Inc.	5	2.44	2.00	25.00	24.00	65.93	34.07
Eastern States Farmers' Exchange	6	2.76	2.50	23.47	23.00	70.91	29.09
Goulard & Olena, Inc.	4	2.48	2.40	25.26	22.75	60.17	39.83
Thomas Hersom & Co.	1	2.70	2.00	24.24	22.00	77.31	22.69
International Agricultural Corp.	{ 8	2.61	2.47	23.09	22.50	71.99	28.01
	{ 1	3.41	2.47	22.83	22.00	81.62	18.30
New England Rendering Co.	8	2.43	2.08	24.75	25.17	65.44	34.56
Old Deerfield Fertilizer Co., Inc.	1	4.87	2.47	18.88	22.00	53.54	46.46
Olds & Whipple, Inc.	2	3.04	2.47	22.96	22.00	74.40	25.60
Carroll S. Page Co., Inc.	1	4.17	3.70	22.20	22.00	16.52	83.48
John Reardon & Sons Co.	6	2.81	2.47	25.64	22.88	60.64	39.36
Rogers & Hubbard Co.	{ 2	3.91	3.69	25.89	24.70	99.18	.82
	{ 1	3.37	3.29	26.53	22.50	69.50	30.50
	{ 2	3.57	3.29	25.89	20.50	39.44	60.56
	{ 3	2.48	2.47	24.11	22.85	63.71	36.29
	{ 1a	3.88	3.70	24.49	22.88	32.00	68.00
N. Roy & Son	1	2.48	2.50	25.89	24.00	55.60	44.40
F. Rynveld & Sons	2	2.65	1.85	21.69	22.88	70.69	29.31
J. H. Scott Co.	5	3.29	2.00	22.71	22.00	67.07	32.93
Van Iderstine Co.	{ 3	2.16	2.00	29.98	29.00	78.27	21.73
	{ 1	2.15	2.00	29.21	29.00	76.59	23.41
Virginia-Carolina Chemical Corp.	1	3.81	3.70	23.22	19.00	45.79	54.21
C. P. Washburn Co.	5	2.86	2.50	23.09	23.00	69.45	30.55

a 1931 stock.

## Miscellaneous.

## Wood Ashes.

MANUFACTURER.	Moisture.	PHOSPHORIC ACID.		POTASSIUM OXIDE.		Calcium Oxide.	Magnesium Oxide.	Insoluble Matter.
		Found.	Guaranteed.	Found.	Guaranteed.			
John Joynt	{ 5.56	1.72	1.00	3.26	3.00	26.96	4.17	14.39
	{ 7.23	1.72	1.00	3.13	3.00	24.27	4.12	14.62
	{ 15.90	1.91	1.00	5.00	3.00	32.21	3.55	-

Note: Dealers and consumers of this product are urged to purchase only from those importers or dealers who have duly registered their material in Massachusetts. Sales of unregistered goods in Massachusetts are illegal and subject to fine. Failure of registration on the part of any importer throws this responsibility upon the local agent, who must arrange to assume both the cost of registration and the tonnage fees provided by the state fertilizer law.

## Pulverized Animal Manures.

MANUFACTURER AND BRAND.	Number of Samples.	TOTAL NITROGEN.		TOTAL PHOSPHORIC ACID.		TOTAL POTASH.		Organic Matter.	Moisture.
		Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
American Agricultural Chemical Co.									
Pulverized Sheep and Goat Manure	10	1.36	1.23	1.15	1.00	2.64	2.00	36.72	12.37
Armour Fertilizer Works									
Armours Sheep and Goat Manure	9	1.52	1.25	1.28	1.00	3.85	2.00	38.41	12.87
Joseph Breck & Sons Corp.									
Breck's Ram's Head Sheep Manure	5	1.35	1.46	.77	.75	3.52	3.00	37.87	8.32
C. E. Buell, Inc.									
Two-In-One Peat-Poultry Manure	6	2.91	3.00	2.64	3.25	1.25	1.50	67.18	16.11
Collins Seed Service Co.									
Special Sheep Manure (1931 stock)	1	2.07	2.06	1.66	1.50	4.16	3.25	38.09	5.94
Consolidated Rendering Co.									
Corenco Sheep Manure	11	1.29	1.23	1.02	.50	2.66	2.00	38.76	10.15
Davey Tree Expert Co.									
Davey Shredded Cattle Manure	1	1.06	1.00	1.15	1.00	2.56	2.00	72.37	5.58
Eastern States Farmers' Exchange									
Goat Manure	2	1.47	1.00	.64	.50	2.73	2.00	37.69	8.83
Thomas W. Emerson Co.									
Venezuelan Goat Manure	1	1.97	1.23	1.15	.50	3.14	2.00	31.32	8.41
Emporia Elevator & Feeding Co.									
Big Sheep Pulverized Sheep Manure	4	1.88	2.00	1.91	1.00	4.03	2.00	66.25	6.75
Goulard & Olena, Inc.									
G & O Sheep Manure	3	1.28	1.50	1.53	1.50	2.98	2.00	34.51	7.79
International Agricultural Corp.									
Caribee Goat Manure	6	1.50	1.25	1.28	.50	2.54	2.00	37.19	10.22
Natural Guano Co.									
'Sheep's Head' Pulverized Sheep Manure	4	1.86	2.00	1.53	1.00	2.42	2.00	74.54	6.78
Pacific Manure & Fertilizer Co.									
Groz-It Sheep Manure	1	1.50	1.50	1.02	.75	3.50	2.50	43.54	8.33
Premier Poultry Manure Co.									
Premier Brand Cattle Manure	2	2.02	1.65	1.15	.85	2.44	2.00	59.35	5.49
Premier Brand Poultry Manure	8	5.02	4.93	2.68	2.75	1.01	1.30	69.38	8.11
Pulverized Manure Co.									
Wizard Brand Cattle Manure	3	2.19	2.00	1.66	1.00	1.98	1.00	64.77	4.74
Wizard Brand Sheep Manure	5	2.01	2.00	1.66	1.00	3.74	2.00	68.38	5.89
Ramshorn Mills									
Ramshorn Sheep Manure & Wool Waste	3	2.00	1.50	.74	.60	5.19	3.75	42.93	9.29
Rogers & Hubbard Co.									
Sheep and Goat Manure	5	1.42	1.35	1.15	.75	3.87	3.75	38.96	12.08
Walker-Gordon Farms									
Driconure	7	1.84	1.00	1.02	1.00	2.05	1.00	80.81	7.38
Driconure (1931 stock)	2	1.77	1.50	1.02	1.00	1.94	1.25	80.34	8.66
W. W. Windle Co.									
Natural Sheep Manure Dusted from Wool	2	2.31	2.44	.48	.92	5.11	4.92	48.84	8.22

## Ground Tobacco Stems.

Manufacturer.	Number of Samples.	Moisture.	NITROGEN		PHOSPHORIC ACID.		POTASH.		Chlorine.
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	
Tobacco By-Products & Chemical Corp.	3	5.69	1.25	1.16	.64	.50	4.19	4.00	.51
Uniform Pro-	1	10.97	2.01	2.00	.38	.25	3.26	4.00	.82
ducts Co., Inc.	1	17.56	2.16	2.00	.64	.25	3.57	4.00	1.51

## Stone Meal.

PLANT FOOD ELEMENTS.	MANUFACTURED BY MENDERTH, INC.			MANUFACTURED BY DONALD S. MCCRILLIS.		
	Guaranteed.	FOUND.		Guaranteed.	FOUND.	
		Soluble in Dilute Hydrochloric Acid.	By Fusion Method.		Soluble in Dilute Hydrochloric Acid.	By Fusion Method.
Potassium oxide . . .	3.33	1.25	2.75	3.00	.06	.95
Calcium oxide . . .	3.48	1.81	2.34	.56	2.31	4.09
Magnesium oxide . . .	6.48	1.72	2.30	2.00	2.55	3.59
Phosphoric acid . . .	.13	.19	.19	.25	.08	.08

No water soluble potash was found or guaranteed in either product.

Based on the above analyses, the commercial plant food value in one ton of McCrillis Stone Meal would be 69 cents; of Menderth, \$1.57. The former was selling for \$30.00 per ton: the latter was quoted in 5-lb. carton, 50 cents; 100-lb. bags, \$3.50; and in 500-lb. lots, \$12.50; larger amounts quoted upon request. The two products do not possess any economic agricultural value and it is inconceivable that anyone after noting their composition could be induced to purchase the products either as a source of plant food or as an insect repellent.

DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZER FOR SALE IN MASSACHUSETTS IN 1932.

Allied Mills, Inc., 210 East Redwood St., Baltimore, Md.  
 American Agricultural Chemical Co., 285 River St., North Weymouth, Mass.  
 American Cyanamid Co., 535 Fifth Ave., New York, N. Y.  
 American Soda Products Co., 121 East Oak Ave., Moorestown, N. J.  
 American Soil Sponge Selling Corp., 6 East 45th St., New York, N. Y.  
 Apothecaries Hall Co., 8-24 Benedict St., Waterbury, Conn.  
 Armour Fertilizer Works, 10 East 40th St., New York, N. Y.  
 Ashcraft-Wilkinson Co., Atlanta, Ga.  
 Associated Chemical Co., Box 226, Hagerstown, Md.  
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.  
 Baker Castor Oil Company of Delaware, 120 Broadway, New York, N. Y.  
 Barrett Co., 40 Rector St., New York, N. Y.  
 Barrie Laboratories, Inc., 80 Federal St., Boston, Mass.  
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.  
 Berkshire Chemical Co., 92 Howard Ave., Bridgeport, Conn.  
 Brague, Inc., Hinsdale, Mass.  
 Joseph Breck & Sons, Corp., 85 State St., Boston, Mass.  
 F. W. Brode Corp., 119 Madison Ave., Memphis, Tenn.  
 C. E. Buell, Inc., 131 State St., Boston, Mass.  
 Cairo Meal and Cake Co., 43d & Sycamore Streets, Cairo, Ill.  
 Lyman Carrier Products, Granger, Ind.  
 Chilean Nitrate Sales Corp., 120 Broadway, New York, N. Y.  
 Clay & Son, Temple Mill Lane, Stratford, London, England.  
 Collins Seed Service Co., 60 Congress St., Boston, Mass.  
 Consolidated Rendering Co., 40 North Market St., Boston, Mass.  
 Curley Brothers, Wakefield, Mass.  
 Davey Tree Expert Co., Kent, Ohio.

John C. Dow Co., Inc., 200 Broadway, Cambridge, Mass.  
 Eastern States Farmers' Exchange, Box 1482, Springfield, Mass.  
 Thomas W. Emerson Co., 213 State St., Boston, Mass.  
 Emporia Elevator & Feeding Co., Emporia, Kan.  
 Essex Fertilizer Co., 39 North Market St., Boston, Mass.  
 Excell Laboratories, 4535 Ravenswood Ave., Chicago, Ill.  
 Foodndrink Co., Room 910, 24 Milk St., Boston, Mass.  
 Ford Motor Co., 3674 Schaefer Road, Dearborn, Mich.  
 H. L. Frost & Co., 20 Mill St., Arlington, Mass.  
 Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.  
 Thomas Hersom & Co., New Bedford, Mass.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 Hyper-Humus Co., Newton, N. J.  
 International Agricultural Corp., 33 Chauncy St., Boston, Mass.  
 Henry James & Son, Inc., 20 Stockbridge St., Springfield, Mass.  
 John Joynt, Lucknow, Ontario, Canada.  
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo, N. Y.  
 Koppers Products Co., Koppers Bldg., Pittsburgh, Penn.  
 Little-Tree Farms, Theodore F. Borst, Owner, Pleasant St., Framingham Centre, Mass.  
 L. B. Lovitt & Co., 1004 Falls Bldg., Memphis, Tenn.  
 Lowell Fertilizer Co., 40 North Market St., Boston, Mass.  
 Maine Farmers Exchange, Inc., 708 Grain & Flour Exchange, Boston, Mass.  
 Maplevale Leafmold Co., East Kingston, N. H.  
 Geo. E. Marsh Co., 393 Chestnut St., East Lynn, Mass.  
 Donald S. McCrillis, Stony Brook, Mass.  
 J. H. McCusker & Sons, 62 Church St., Waltham, Mass.  
 Menderth, Inc., 126 State St., Boston, Mass.  
 Merrimac Chemical Co., Inc., Everett Station, Boston, Mass.  
 Miller Fertilizer Co., Baltimore Trust Bldg., Baltimore, Md.  
 Milwaukee Sewerage Commission, Milwaukee, Wis.  
 Natural Guano Co., Aurora, Ill.  
 New England Dressed Meat & Wool Co., 174 Somerville Ave., Somerville, Mass.  
 New England Fertilizer Co., 40-A North Market St., Boston, Mass.  
 New England Rendering Co., R 39 Market St., Brighton, Mass.  
 Nitrate Agencies Co., 104 Pearl St., New York, N. Y.  
 N. V. Potash Export My. Inc. of Amsterdam, Holland, 2404 Baltimore Trust Bldg., Baltimore, Md.  
 Old Deerfield Fertilizer Co., Inc., 28 Sugarloaf St., South Deerfield, Mass.  
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.  
 Pacific Manure & Fertilizer Co., 429 Davis St., San Francisco, Cal.  
 Carroll S. Page Co., Inc., Hyde Park, Vt.  
 Parmenter & Polsey Fertilizer Co., 41 North Market St., Boston, Mass.  
 Pawtucket Rendering Co., Rear 654 Mineral Spring Ave., Pawtucket, R. I.  
 Pedigreed Seed Co., Inc., 74 Reade St., New York, N. Y.  
 Fred G. Phillips, 12 Circuit Road, Dedham, Mass.  
 Piedmont-Mt. Airy Guano Co., Inc., 1801 Baltimore Trust Bldg., Baltimore, Md.  
 Plantabbs Corp., Baltimore, Md.  
 Arthur B. Porter, Inc., 55 Dearborn St., Salem, Mass.  
 Premier Poultry Manure Co., 327 South LaSalle St., Chicago, Ill.  
 Pulverized Manure Co., 828 Exchange Ave., Chicago, Ill.  
 Ramshorn Mills, West Millbury, Mass.  
 John Reardon & Sons Co., 51 Waverly St., Cambridge, Mass.  
 Rogers & Hubbard Co., Middletown, Conn.  
 N. Roy & Son, 675 Washington St., Attleboro, Mass.  
 F. S. Royster Guano Co., Baltimore, Md.  
 F. Rynveld & Sons, 55 West 26th St., New York, N. Y.  
 Salem Chemical & Supply Co., 26 Dearborn St., Salem, Mass.  
 J. H. Scott Co., 10 High St., Boston, Mass.  
 O. M. Scott & Sons Co., Marysville, Ohio.  
 M. L. Shoemaker & Co., Inc., 3600 North Delaware Ave., Philadelphia, Penn.  
 Smith Agricultural Chemical Co., Columbus, Ohio.  
 Springfield Rendering Co., Springfield, Mass.  
 Standard Wholesale Phosphate & Acid Works, Inc., Baltimore, Md.  
 Stimulant Laboratories, Inc., 42-26, 28th St., Long Island City, N. Y.  
 Sutton & Sons, Ltd., Reading, England.  
 Swift & Company, Fertilizer Works, Baltimore, Md.  
 F. Sylvester & Son, 11 Cheever St., Revere, Mass.  
 Synthetic Nitrogen Products Corp., 285 Madison Ave. New York, N. Y.  
 Tennessee Corp., Lockland, Ohio.  
 Tobacco By-Products & Chemical Corp., Louisville, Ky.  
 Uniform Products Co., Inc., 111 Fifth Ave., New York, N. Y.  
 Van Iderstine Co., Long Island City, N. Y.  
 Victory Fertilizer Corp., 177 State St., Boston, Mass.  
 Virginia-Carolina Chemical Corp., 20 Exchange Place, New York, N. Y.  
 Virginia-Carolina Chemical Corp., Richmond, Va.  
 Walker-Gordon Farms, Juliustown, N. J.  
 C. P. Washburn Co., Middleboro, Mass.  
 W. W. Windle Co., 95 West Main St., Milbury, Mass.  
 Woodard Bros., Greenfield, Mass.  
 Worcester Rendering Co., Auburn, Mass.







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MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 66

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Inspection of Agricultural  
Lime Products

By H. D. Haskins

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This is the twenty-first report on the inspection of agricultural lime products in Massachusetts. It gives the composition of the various products which have been sold, supplemented by comparative costs of units of effective oxides present. Supplementary definitions and interpretations are given for lime products used in agriculture.

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Massachusetts State College  
Amherst, Mass.

# INSPECTION OF AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1932.

By H. D. Haskins, Official Chemist.<sup>1</sup>

## Manufacturers and Brands.

During 1932, twenty-two firms registered for sale in Massachusetts thirty-six brands of agricultural lime and two of gypsum or land plaster. The products are grouped as follows:

Hydrated or slaked lime	17
Ground limestone	17
Lime kiln ashes	1
Oyster shell lime	1
	<hr/>
	36
Gypsum	2

With the exception of two brands of hydrated lime registered by the Eastern States Farmers' Exchange, and one of lime kiln ashes registered by H. D. Brewer, all of the brands registered were sampled and analyzed. The samples were drawn largely during the spring months from every section of the state by the same sampling agents who drew the fertilizer samples for the inspection of that commodity. A total of 71 samples was drawn from stock found in the possession of 65 agents or owners.

## Variations and Deficiencies in the Composition of Lime Products.

In the hydrated lime products, Table I, only one serious deficiency was noted. The Allyndale Burned Lime, manufactured by Allyn and Allyn, East Canaan, Ct., showed a deficiency of 10.6 per cent of calcium oxide and 2.55 per cent of magnesium oxide. Four other brands showed small deficiencies either in magnesium or calcium, but these were more than made up by overruns in the other ingredient, so that no commercial shortage was noted.

In Table II, Fine Ground Limestone, only two small deficiencies were noted and both were found on the same brand put out by Hazen Brothers.

The efficiency of some of the brands in this group could be materially improved by finer grinding. Between 70 and 80 per cent passing through a 100-mesh sieve shows a satisfactory degree of fineness, and it should be the endeavor of all producers to achieve this tentative standard.

No deficiencies were found in the gypsum products.

## Purchase of Lime Products

The principal factors which determine the most economical purchase of lime are: composition of product, effective oxides (calcium oxide equivalent) in one ton of lime, cost of lime at plant, freight charges to destination, hauling cost from R. R. station to farm, and, in case of limestone, the mechanical fineness. As regards the choice between hydrated lime and fine ground limestone, if the limestone is ground so that 100 per cent will pass an 80-mesh sieve and is used in amounts to furnish the same quantity of calcium oxide equivalent as the hydrated product, it will usually be found to be quite as effective.

<sup>1</sup>Assisted by H. Robert DeRose, Albert F. Spelman, J. W. Kuzmeski, Chemists; James T. Howard, C. L. Whiting, A. G. Brigham and G. E. Taylor, Sampling Agents; Harry L. Allen Laboratory Assistant.

Oftentimes personal preference determines the selection of the form of lime to be purchased. When the haul from the depot to the farm is a long one, the unit cost of calcium oxide equivalent would be more favorable for the hydrated lime, and the same may be said with reference to its distribution in the field. On the other hand, the ground limestone may be applied in the field with much less discomfort.

It is usually good practice to buy collectively; that is, by several farmers ordering together, thus securing the advantage of much cheaper freight by car lot shipments. When located sufficiently near a lime plant to permit economical truck delivery, oftentimes a considerable saving can be made by this system of shipment. If shipment by rail is deemed more economical, it is usually desirable to write to several firms asking for quotations on 20- or 25-ton car lots delivered at the consumer's R. R. station. An example follows where it is assumed that two groups of farmers, one located in Whately and the other in Leominster, are in the market for a 25-ton car of lime and want to know whether fine ground limestone or hydrated lime is the more economical product to buy. The Whately group wants the high magnesium product, while the Leominster group prefers the high calcium product. They secure quotations f. o. b. at destination, and by reference to the lime bulletin obtain data as to the composition of each product. The table which follows illustrates the mode of calculating and assembling the data from which a choice of lime product may be intelligently and economically made.

	HIGH MAGNESIUM LIME WHATELY				HIGH CALCIUM LIME LEOMINSTER			
	GROUND LIMESTONE		HYDRATED LIME		GROUND LIMESTONE		HYDRATED LIME	
	A	B	C	D	E	F	G	H
Calcium oxide, per cent	30.81	30.60	46.50	44.73	51.70	53.90	62.23	65.97
Magnesium oxide, per cent	21.08	20.50	33.26	30.06	2.10	.91	.58	.65
Calcium oxide equivalent: <sup>1</sup>								
Per cent	60.11	59.10	92.73	86.51	54.62	55.17	63.04	66.87
Pounds in one ton	1,202	1,182	1,855	1,730	1,092	1,103	1,261	1,337
Ton quotation, plus 50 cents for cartage to farm	\$6.06	\$6.56	\$11.30	\$10.30	\$7.50	\$6.31	\$10.50	\$10.40
Cost of 100 pounds of calcium oxide equivalent	\$0.50	\$0.55	\$0.61	\$0.60	\$0.69	\$0.57	\$0.83	\$0.78

<sup>1</sup>Magnesium oxide x 1.39 + calcium oxide.

NOTE: The ton cost of the product delivered at the farm, divided by the pounds of calcium oxide equivalent in one ton, and multiplied by 100, gives the cost of 100 pounds of calcium oxide equivalent.

### Lime Definitions and Interpretations.

The following definition and interpretation of lime products used in agriculture were adopted as official by the Association of Official Agricultural Chemists at their meeting in November, 1932.

**Net Weights.** The weights appearing on packages of fertilizer, agricultural lime and liming material shall always mean net weights.

**Agricultural Liming Materials** are any substances that contain calcium and magnesium in condition and quantity suitable for use in neutralizing soil acidity.

### Explanation of Tables of Analyses.

Table I, "Proportion of total oxides as carbonates." The data furnished in this column are calculated from an actual determination of carbon dioxide ( $\text{CO}_2$ ). Calcium or magnesium not in the form of carbonate is present either as hydrated lime (water- or air-slaked) or as burned lime (caustic or unslaked). It should be understood that all of the products listed in this table have at some time been burned, and the proportion of oxides present as carbonates indicates to what extent the product has absorbed carbonic acid from the air.

"Calcium oxide equivalent" represents the acid neutralizing value of both the magnesium and calcium, expressed in terms of calcium oxide. The figures in the "per cent" column are obtained by multiplying the magnesium oxide by the factor 1.39 and adding the calcium oxide; or they may be obtained by a direct titration with standard acid. All samples are checked by both methods in this laboratory. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20. The "cost of 100 pounds" is based on prices furnished by the producers.

Table II, "Calcium oxide equivalent: pounds in one ton." In securing these data the degree of fineness to which the limestone has been ground is taken into consideration. On those products which are finely ground so that all of the material will pass through a 20-mesh sieve, it is assumed that all of the calcium and magnesium oxides will become available in the soil within a five-year period. On those products which will not wholly pass a 20-mesh sieve, it is assumed that the oxides in that portion which is coarser than 20-mesh will be only 50 per cent effective during the same period.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass the various meshed sieves mentioned.

In both tables the figures in parenthesis following the brand name show the number of samples collected and analyzed.

Table I. Hydrated or Slaked Lime.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		Proportion of Total Oxides as Carbonates.	CALCIUM OXIDE EQUIVALENT.		
	Found.	Guaranteed.	Found.	Guaranteed.		Per Cent.	Pounds in One Ton.	Cost of 100 Pounds.
Allyn and Allyn, East Canaan, Ct.								
Allyndale Burned Lime (1)	44.40	55.00	29.45	32.00	1/5	85.34	1,707	\$0.38
Howard D. Brewer, 45 Arctic St., Worcester, Mass. (a)								
Producto Agricultural Lime (3)	63.93	60.00	3.77	1.00	1/5	69.17	1,383	.33
Producto Agricultural Hydrated Lime (1)	62.23	60.00	.58	1.00	3/7	63.04	1,261	.56
Burton K. Harris, Saylesville, R. I. (b)								
Dexter Agricultural Lime (3)	51.90	50.00	19.85	20.00	1/33	79.49	1,590	.69
Hoosac Valley Lime Co., Inc., Adams, Mass.								
Adams Land Lime (1)	61.13	58.00	.72	.50	1/4	62.13	1,243	.44
Lawrence Portland Cement Co., Thomaston, Me.								
Dragon Mainrok Agricultural Hydrated Lime (4)	70.85	68.00	.51	.20	1/10	71.56	1,431	.44
Dragon Mainrok Agricultural Hydrated Lime (1)	73.15	68.00	1.05	.20	1/20	74.61	1,492	.43
Lee Lime Corporation, Lee, Mass.								
Lee Agricultural Hydrated Lime	46.50	47.00	33.26	28.00	1/20	92.73	1,855	.40
New England Lime Co., Pittsfield, Mass. (c)								
Agricultural Hydrated Lime (Canaan, Ct.) (1)	44.73	40.00	30.06	14.00	1/10	86.51	1,780	.40
Agricultural Hydrated Lime (Adams) (1)	60.76	50.00	.72	1.50	1/2	61.76	1,235	.57
Agricultural Hydrated Lime (Adams) (1)	65.97	65.00	.65	1.00	3/10	66.87	1,337	.52
Rockland & Rockport Lime Corporation, Rockland, Me.								
R. R. Land Lime, Grade C. (2)	62.53	60.00	1.59	.50	1/5	64.74	1,295	.50
R. R. Land Lime, Grade M. (1)	62.69	60.00	3.11	4.00	2/5	67.01	1,340	.49
United States Gypsum Co., 300 West Adams St., Chicago, Ill. (d)								
U. S. G. Agricultural Hydrated Lime (1)	71.84	70.00	.58	none	1/33	72.65	1,453	.78
U. S. G. Agricultural Hydrated Lime (1)	70.32	70.00	.51	none	1/20	71.23	1,425	.80
U. S. G. Agricultural Lime (2)	65.24	60.00	.58	none	2/5	66.05	1,321	.38

<sup>a</sup>Plant at Winooski, Vermont.

<sup>b</sup>Shipping point, Berkeley, R. I.

<sup>c</sup>Plants at Adams, Mass., and Canaan, Ct.

<sup>d</sup>Plants at Farnams, Mass., and Falls Village, Ct.

Table II. Ground Limestone

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		CARBONATES OF CALCIUM AND MAGNESIUM.		CALCIUM OXIDE EQUIVALENT			MECHANICAL ANALYSIS (PER CENT)			
	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Per Cent.	Pounds in 1 Ton.	Cost of 100 Pounds.	Finer than 100-mesh.	Between 100 and 80-mesh.	Between 80 and 60-mesh.	Between 60 and 40-mesh.
American Agricultural Chemical Co., 285 River St., North Weymouth, Mass. (a) Fine Ground Limestone (2)	30.86	30.00	20.94	19.00	98.86	93.29	59.97	1,199	\$0.33	56.25	4.45	13.30	12.30
Howard D. Brewer, 45 Arctic St., Worcester, (b) Producto Agricultural Limestone (1)	51.70	44.00	2.10	.50	96.65	90.00	54.62	1,092	.37	78.91	1.30	5.53	7.13
Dominion Lime Co., East Angus, Quebec, Canada. (c) Dudswell Brand Agricultural Limestone (1)	53.73	52.00	1.29	.50	98.58	94.00	55.52	1,110	.53	79.81	1.50	6.50	6.10
Dudswell Brand Agricultural Limestone (3)	52.88	52.00	.94	.50	98.30	94.00	54.19	1,084	.54	78.22	1.25	5.65	10.19
Eastern States Farmers' Exchange, Springfield, Mass. (d) Magnesium Limestone (1)	30.21	29.50	20.57	20.50	96.93	95.00	58.80	1,176	.36	56.86	5.20	22.20	1.91
Grangers Manufacturing Co., Hart- ford, Conn. (e) Grangers Agricultural Limestone (6)	39.30	35.00	7.10	1.00	84.98	90.00	49.17	983	.34	80.33	1.74	6.57	5.62
Hazen Brothers, 14 Lake St., Arlington Mass. High Grade Lime (1).	53.71	54.54	.58	.87	97.06	99.21	54.52	1,090	.55	66.13	5.97	17.90	1.10
High Grade Lime (1).	53.96	54.54	.51	.87	97.36	99.21	54.67	1,093	.55	53.16	2.50	17.10	8.54
Hoosac Marble Co., No. Adams, Mass. Ground Limestone (1)	53.03	50.00	.94	.75	96.64	97.00	54.36	1,087	.39	93.37	2.20	2.52	1.01
Ground Limestone (1)	54.75	50.00	.88	.75	99.54	97.00	55.97	1,119	.38	92.37	3.03	4.03	none
Hoosac Valley Lime Co., Inc., Adams, Mass. Hoosac Agricultural Limestone (2)	52.89	50.00	.94	.75	96.35	97.00	54.20	1,084	.32	44.89	2.63	14.85	24.50

Limestone Products Corporation of America, Newton, N. J.	41.68	34.00	6.24	1.00	87.43	62.00	50.35	1,007	(i)	.42	92.93	1.31	3.19	1.82	.75
Line Crest Pulverized Limestone (3)															
Miller Lime Products Corporation, West Stockbridge, Mass.	36.58	35.00	12.68	6.00	91.80	90.00	54.21	1,084	.32		74.93	1.44	3.70	4.84	15.09
Monarque Agricultural Limestone (1)															
New England Lime Co., Pittsfield, Mass. (f)	51.85	45.00	1.01	.50	94.64	80.00	53.25	1,065	.40		65.84	4.50	14.08	11.92	3.66
Agricultural Ground Limestone (1)															
Pownal Lime Co., 285 River St., North Weymouth, Mass. (g)	47.62	45.00	5.36	5.00	96.19	90.00	55.07	1,101	.39		83.76	.80	5.18	3.51	6.75
Fine Ground Limestone (4)															
Donald U. Smith, Ashley Falls, Mass. Ashley White Dolomite Agricultural Limestone (7)	30.81	28.00	21.08	19.00	99.06	93.29	60.11	1,202	.31		48.65	3.62	15.42	17.58	14.73
Rockland and Rockport Lime Corporation, Rockland, Me.															
R. R. Ground Limestone (1)	49.10	48.00	1.77	1.00	91.39	92.00	51.56	1,031	.29		97.94	.76	1.30	none	none
Solvay Process Co., Syracuse, New York (h)															
Solvay Pulverized Limestone (1)	48.11	46.50	2.68	1.50	91.45	86.14	51.84	1,037	.36		78.80	2.20	6.70	5.30	7.00
United States Gypsum Co., 300 West Adams St., Chicago, Ill. (d)															
U. S. G. Agricultural Limestone (3)	30.60	29.50	30.50	20.50	97.48	95.00	59.10	1,182	.40		53.7	6.37	22.72	14.78	2.43
Warren Oyster Co., Inc., Warren, R. I.															
Oyster Shell Lime (1)	47.16	45.00	.76	.50	85.75	80.00	48.22	790	-		20.72	1.84	6.59	8.06	26.63

NOTE: All but one of the products were ground fine enough so that 100 per cent passed a 20-mesh sieve. In the one case, Oyster Shell Lime manufactured by the Warren Oyster Company, 36.16 per cent did not pass a 20-mesh sieve.

<sup>a</sup>Plant at Ashley Falls, Mass.

<sup>b</sup>Plant at Winooski, Vt.

<sup>c</sup>Plant at Dudswell Junction, Quebec, Can.

<sup>d</sup>Plant at Falls Village, Conn.

<sup>e</sup>Plant at West Stockbridge, Mass.

<sup>f</sup>Plant at Adams, Mass.

<sup>g</sup>Plant at North Pownal, Vt.

<sup>h</sup>Plant at Jamesville, N. Y.

ils willing to absorb some freight in order to compete with other lime firms selling in New England.



Table III. Gypsum or Land Plaster.

Name of Manufacturer and Brand.	Calcium Oxide (CaO).		Calcium Sulfate (CaSO <sub>4</sub> ).		Calcium and Magnesium Carbonates Found.
	Found.	Guar- anteed.	Found.	Guar- anteed.	
<b>Atlantic Gypsum Products Co., Ports- mouth, N. H.</b>					
Atlantic Agricultural Gypsum (1) . .	33.20	31.50	76.54	75.50	4.49
Atlantic Agricultural Gypsum (1) . .	33.64	30.61	78.75	74.76	4.56
<b>United States Gypsum Co., 300 West Adams Street, Chicago, Ill.</b>					
Ben Franklin Agricultural Gypsum (1) .	32.79	30.00	75.74	64.50	3.99

NOTE: The small amount of calcium and magnesium carbonates present in gypsum would, to a slight extent, neutralize sour soils: the calcium sulfate would not be effective for this purpose.

# MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 67

FEBRUARY, 1933

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## Seed Inspection

By F. A. McLaughlin and Margaret E. Nagle

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This Report, the fifth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1932 by the Commissioner of Agriculture, who is named in the Act as Administrative Officer (Acts and Resolves of 1927, Chapter 274).

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.

## FOREWORD

The seed law in Massachusetts, which has been in operation for five years, is enforced by the State Department of Agriculture. It has been the policy to acquaint seed dealers with the provisions of the law, which has a two-fold purpose.

1. The true labeling of seeds will enable purchasers to know what they are buying.
2. A uniform compliance with the provisions of the seed law relating to the testing, analyzing, and sale of agricultural seeds should do away with much unfair competition among seed dealers.

For the most part, satisfactory cooperation has been received from dealers handling agricultural seeds in this State, and it is felt that the operation of the seed law has been instrumental in bringing about a more healthy condition regarding the sale of quality seeds in Massachusetts. It is the policy of the Department of Agriculture to give special attention to those dealers and distributors who have not shown any indication of cooperating, and to use the police power of the Department if necessary to bring about a full compliance with the provisions of the Massachusetts seed law. Hearings will be held in cases where the tests and analyses made by the Seed Laboratory in Amherst show that the label being used by the seed dealer indicates a much higher quality of seed than the official tests. Further regulatory action will be taken in cases where methods now being used to obtain a substantial compliance with the seed law fail to bring about the desired results.

# SEED INSPECTION

By F. A. McLaughlin and Margaret E. Nagle<sup>1</sup>

This bulletin contains the results of the inspection of agricultural seeds from October 1, 1931 to October 1, 1932. The Seed Laboratory analyzed 1,516 samples of seed, 463 of which are termed official samples and were collected by inspectors of the State Department of Agriculture in 59 towns of the State, 36 of which had not been included in previous inspections. Of the remaining samples, 304 came from dealers and farmers; 194 were received from the Rhode Island Department of Agriculture; 354 were purchased from wholesalers for field tests; and 201, ingredients of lawn seed, were germinated to determine viability of such seed in mixtures.

Field tests to determine trueness to type were again conducted in cooperation with the Department of Agronomy which tested 11 samples of alfalfa, 23 samples of red clover, and 3 samples of sweet clover; and the Department of Vegetable Gardening which tested 339 samples of sweet corn and 115 samples of peas.

## Summary of Results

In the following tables which record laboratory analyses of official samples of seed together with copies of the label under which the seeds were sold, it will be observed that the most common violation is the lack of certain information required by law.

### Alfalfa to Vetch

In the first table, including seeds from Alfalfa to Vetch, the analyses of 161 samples are recorded. Only 44 of these were wholly and correctly labeled. In other words, only 27 per cent of the seed in this group of samples was legally offered for sale. Of the remaining 117 samples, 95 failed to state the percentage of purity, percentage by weight of weed seed, percentage of germination, date of germination, or all four.

In 47 samples the purity was found less than the tolerance allowance, germination less than tolerance allowance, or the weed seed greater than tolerance allowance. Three samples of South German Mixed Bent were sold under the name of Creeping Bent, an old trade name which is no longer allowable because it is misleading, implying that the seed thus named is pure creeping bent. Sample A-82, which was labeled Spring Barley, was found to be Rye.

In most instances the absence of information on the sales label of seed was found to be due to carelessness on the part of the retailer who had destroyed or lost the tag attached by the wholesaler. For the most part, the wholesaler should be absolved from blame in this particular.

### Mixtures of Not More Than Two Sorts of Seed

No samples declared as such were taken by inspectors. Three samples declared under the previous section as single seed were, however, found to be mixtures as defined by law. Analysis showed them not only illegally declared in this respect, but otherwise deficient.

### Special Mixtures

The laboratory analyzed 41 samples of lawn and pasture mixtures. The tables show that only 15 of these were legally offered for sale. Of the remaining 26 samples, 8 failed to name ingredients at all and 6 failed to designate the variety, as for instance "Ryegrass" for "Domestic Ryegrass." Samples C-18 and C-23 were found to be entirely different mixtures than indicated. Correspondence with the wholesaler in each instance indicates that the retailer mixed his labels. C-40 failed to declare noxious weeds. Only 5 samples were found to have excessive weed seed, and 8 excessive inert material. In this

<sup>1</sup> Miss Jessie L. Anderson served as seed analyst for a period of three months.

group, as with the previous two, violations were largely the product of carelessness in not retaining the wholesaler's tag or imperfectly copying it.

Although the law does not require a stated germination for each of the kinds of seeds in a mixture of more than two ingredients, the laboratory tested each mixture for germination of each agricultural seed contained. The tables do not show this record. As a whole the performance was satisfactory. Low germination was mostly confined to seed like Chewings New Zealand Fescue which loses a great part of its viability in a few months' time. Low germination of all the ingredients in a given sample occurred infrequently, indicating that the mixture was not made during the current year

### Vegetable Seed

All of the 258 samples of seed in this group were found to be sold in compliance with the law which requires that the kind and variety of the seed be stated with the name and address of the vendor. Seeds from each sample were germinated and the records included here indicate that 122 samples showed germination below the standards required by law in several of the states. A table averaging the standards of several states is shown on page 4, Control Series Bulletin No. 56, 1930. If the quality of vegetable seed sold in Massachusetts can be measured by the germination records, there is clearly a need of revision in the Vegetable Seed Law.

### Explanation of Tables

In these tables the seeds are listed in alphabetical order by groups, each group containing only those seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. Section 261-A of the Acts and Resolves of 1927, Chapter 274, defines the group from Alfalfa to Vetch, inclusive; Section 261-B, Mixtures; Section 261-C, Special Mixtures; and Section 261-D, Vegetables.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F," what was found in the laboratory analysis. Attention is called to certain irregularities by the following:

The asterisk (\*) shows violation in labeling.

Boldface type indicates low purity, low germination, excessive weed seed, or excessive inert material, depending upon the column in which it is found.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except in those tables which list seeds falling under sections of the law not requiring purity or germination on the label. For the application of "Purity Tolerance," the sample is considered as made up of two component parts: (1) the component being considered, and (2) the balance of the sample. The tolerance in percentage allowed for each component shall be two-tenths of one per cent (0.2%) plus twenty per cent (20%) of the lesser of the two parts. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

<i>Given Germination (%)</i>	<i>Allowable Variation (%)</i>
90 or over.....	6
80 or over, but less than 90 .....	7
70 or over, but less than 80 .....	8
60 or over, but less than 70 .....	9
Less than 60.....	10

# 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

## SEED INSPECTION

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Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>ALFALFA</b>							
A-141	THE ALBERT DICKINSON CO., Chicago, Ill. Grimm Alfalfa, Lot 27382-3 Frank Howard, Pittsfield	(L. 93.30 (F. 99.10	.48 .36	— .12	— .42	81-11 78-12	12/31 7/32
A-74	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Grimm Alfalfa Essex County Farmers' Ass'n, Topsfield	(L. 99.55 (F. 99.69	.15 .11	.25 .14	.05 .06	67-28 77-14	* 7/32
A-159	ROSS BROS. CO., Worcester, Mass. Grimm Alfalfa Ross Bros. Co., Worcester	(L. 99.50 (F. 99.30	.02 .07	— .07	— .56	92 83-6	1/32 7/32
A-99	N. WERTHEIMER & SONS, Buffalo, N. Y. Alfalfa Cutler Grain Co., Framingham	(L. * (F. 98.99	* .59	— .38	— .04	* 70-4	* 7/32
A-56	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Alfalfa Treat Hardware Co., Lawrence	(L. * (F. 95.67	* .25	— 3.75	— .33	73-2 74-2	4/32 7/32
A-80	Pan-American Alfalfa F. B. Keene Hardware, Amesbury	(L. * (F. 99.03	* .69	— .14	— .14	* 41-1	* 7/32
<b>BARLEY</b>							
A-97	THOMAS W. EMERSON CO., Boston, Mass. Beardless Barley Fiske Hardware Co., Natick	(L. 99.00 (F. 98.93	.05 .00	— .25	— .82	95 48	3/31 7/32
A-155	ROSS BROS. CO., Worcester, Mass. Two-Rowed Barley Ross Bros. Co., Worcester	(L. 98.51 (F. 99.07	* Trace	— .10	— .83	92 94	12/31 7/32
<b>BENT GRASS</b>							
A-160	ROSS BROS. CO., Worcester, Mass. South German Bent Ross Bros. Co., Worcester	(L. * (F. 84.24	* .52	— 15.17	— .07	* 83	* 7/32

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A-122	Japanese Buckwheat. Robert F. Cross, Osterville	(L. 98.00 (F. 99.08	* .05	— .37	— .50	95 59	*32 8/32
A-153	ROSS BROS. CO., Worcester, Mass. Japanese Buckwheat. Ross Bros. Co., Worcester	(L. 99.65 (F. 99.44	.12 .10	— .46	Trace	95 91	1/32 7/32
A-81	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Japanese Buckwheat. F. B. Keene Hardware, Amesbury	(L. 98.00 (F. 99.03	* .06	— .91	— .00	90 30	2/29 7/32
<b>ALSIKE CLOVER</b>							
A-76	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Alsiike Clover. Essex County Farmers' Ass'n., Topsfield	(L. 98.86 (F. 98.94	.22 .19	.51 .53	.41 .34	73-22 81-15	* 7/32
A-65	THOMAS W. EMERSON CO., Boston, Mass. Alsiike Clover.	(L. * (F. 95.17	*	— .62	— 2.77	* 78-11	* 7/32
A-93	Alsiike Clover. Lockhart Hardware Co., Natick	(L. * (F. 95.96	*	— .30	— 2.72	* 76-13	* 7/32
A-100	NUNGESSER-DICKINSON CO., New York, N. Y. Alsiike Clover, Lot No. 2129 J. Cushing Co., North Abington	(L. 95.00 (F. 95.07	.60 .08	— .42	— 4.43	93 80-14	3/31 7/32
A-146	STANFORD SEED CO., Buffalo, N. Y. Alsiike Clover, Lot 5290 Platt & Goslee, Gt. Barrington	(L. 97.14 (F. 96.71	.78 .55	— .37	— 2.37	88-8 81-6	2/31 7/32
A-36	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Alsiike. Webster Grain Co., Webster	(L. 98.00 (F. 97.90	.32 .70	— .66	— .74	84-13 78-12	* 7/32
A-134	Pan-American Alsiike, Lot No. 1601 Hampshire Hardware Co., Northampton	(L. 98.00 (F. 97.96	.51 .44	— .29	— 1.31	80-10 75-11	1/32 7/32
A-136	Pan-American Alsiike. Ryther & Warren, Belchertown	(L. 98.00 (F. 98.45	.50 .41	— .05	— 1.09	90 73-21	7/31 7/32

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>CRIMSON CLOVER</b>							
A-115	JOSEPH BRECK & SONS CORP., Boston, Mass. Crimson or Scarlet Clover..... C. L. Goodspeed, Dennis	(L. 98.00 (F. 98.61	* .09	— 1.28	— .02	80 66-1	* 7/32
A-52	JOSEPH BRECK & SONS CORP., Boston, Mass. Red Clover..... W. D. Adlington Hardware Co., Saugus	(L. 98.00 (F. 98.94	* .45	— .47	— .14	90 54-2	*30 7/32
A-37	THOMAS W. EMERSON CO., Boston, Mass. Red Clover..... Webster Grain Co., Webster	(L. 99.30 (F. 98.33	.50 1.49	— .10	— .08	94 90-5	11/31 7/32
A-64	Red Clover..... Poor & Company, Topsfield	(L. * (F. 99.73	* .07	— .10	— .10	* 82-9	* 7/32
A-101	NUNGESSER-DICKINSON SEED CO., New York, N. Y. Medium Red Clover, Lot No. 24890..... J. Cushing Co., North Abington	(L. 98.00 (F. 98.93	.40 .48	— .30	— .29	92 82-3	2/31 7/32
A-34	ROSS BROS. CO., Worcester, Mass. Medium Red Clover..... LaPalme Hardware Co., Webster	(L. 98.00 (F. 97.49	1.40 2.04	— .02	— .45	93 84-11	2/32 7/32
A-133	STANFORD SEED CO., Buffalo, N. Y. Red Clover, Lot No. 5334..... J. A. Sullivan & Co., Northampton	(L. 99.00 (F. 98.84	.56 .65	— .14	— .37	89-7 5 72-11	3/31 7/32
A-148	Red Clover..... Newcomb Hardware Co., Greenfield	(L. 99.00 (F. 99.50	.32 .31	— .12	— .07	85-7 85-8	5/31 7/32
A-21	N. WERTHEIMER & SONS, Buffalo, N. Y. Red Clover Matrix..... Warren Grain Co., Warren	(L. 98.50 (F. 94.91	.58 3.66	.44 1.01	— .42	90-3 89-3	2/32 7/32
A-22	Medium Red Clover Matrix..... Ware Grain & Coal Co., Ware	(L. 98.50 (F. 98.85	.58 .53	.44 .38	.48 .24	90-3 92-2	2/32 7/32

## SEED INSPECTION

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A-32	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Domestic Pan-American Red Clover, Lot No. 5206. Oxford Grain Co., Oxford	(L. 99.06 F. 98.92)	.59 .73	.22	.13	93 90-1	2/32 7/32
A-111	Pan-American Domestic Red Clover. Phillips Bates & Co., Marshfield	(L. 99.00 F. 99.24)	.23 .33	.29	.14	90 85-4	8/31 7/32
A-14	WHOLESALE NOT NAMED Red Clover Carlisle Hardware Co., Springfield	(L. * F. 98.93)	*	.26	.53	*	6/32
A-46	Red Clover A. H. Whidden & Sons, Peabody	(L. * F. 98.03)	*	.30	.48	*	7/32
A-144	Red Clover Haskell-Broderick Co., Lenox	(L. * F. 98.96)	*	.42	.5	*	7/32
SWEET CLOVER							
A-75	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. White Blossom Sweet Clover Essex Co. Farmers' Ass'n., Topsfield	(L. 99.35 F. 98.95)	.07 .06	.56 .38	.02 .61	83-6 74-4	* 7/32
A-27	THOMAS W. EMERSON CO., Boston, Mass. White Sweet Clover J. B. Sibley & Son, Ware	(L. * F. 98.47)	.39	.12	1.02	*	7/32
A-89	N. W. Alfalfa Curley Bros. Grain Co., Wakefield (Sweet Clover)	(L. 99.44 F. 99.23)	*	.00	.63	92 67-6	11/30 7/32
WHITE CLOVER							
A-10	JOSEPH BRECK & SONS CORP., Boston, Mass. White Clover Winer's Hardware Stores, Quincy	(L. * F. 96.28)	* 1.48	.81	1.43	*	7/32
A-57	Choice White Clover. Pentucket Hardware Co., Haverhill	(L. 98.00 F. 97.44)	* 1.59	.11	.86	90 65-23	* 7/32
A-61	White Clover B. F. Hill Hardware, Salem	(L. 98.00 F. 96.98)	* 1.64	.31	1.07	90 66-20	* 7/32

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
WHITE CLOVER—Continued							
A-62	White Clover..... B. F. Hill Hardware, Salem	(L. 98.00 (F. 96.74	* 1.25	— .19	— 1.82	90 71-18	* 7/32
A-45	THOMAS W. EMERSON CO., Boston, Mass. White Clover..... A. H. Whidden & Sons, Peabody	(L. 99.09 (F. 97.90	* .87	— .47	— .76	94 79-5	* 9/32
A-119	White Clover..... Myron G. Bradford, Hyannis	(L. * (F. 96.87	* 1.31	— .42	— 1.40	* 64-4	* 7/32
A-124	Choice White Clover..... C. T. Eastman, Falmouth	(L. 99.09 (F. 98.72	* .71	— .22	— .35	90 76-12	* 1/32 7/32
A-17	H. C. PUFFER, Springfield, Mass. White Clover..... Chapin & Clark Co., West Springfield	(L. * (F. 94.94	* .53	— .53	— 4.00	* 76-18	* 7/32
A-1	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. White Clover..... O. C. Alderman, Springfield	(L. 95.00 (F. 94.74	1.63 1.63	— 3.05	— .58	41-50 60-34	* 3/32
A-11	Choice White Clover..... Hall & Torrey Co., Rockland	(L. 95.25 (F. 96.31	1.63 .80	— 2.35	— .54	41-50 46-39	* 7/32
A-44	White Clover..... Hutchinson Hardware, Lynn	(L. * (F. 95.49	* 1.37	— 2.93	— .21	* 68-30	* 7/32
A-120	White Clover..... Hyannis Hardware, Hyannis	(L. * (F. 97.00	* 1.27	— .54	— 1.19	* 74-20	* 7/32
A-121	Fancy White Clover..... Ryder's, Inc., Hyannis	(L. 97.00 (F. 90.80	.60 1.10	— 1.15	— 6.95	88 72-11	* 7/32
A-18	WHOLESALE NOT NAMED White Clover..... E. C. Bradway, Monson	(L. * (F. 92.08	* .91	— .72	— 6.29	* 76-8	* 7/32

## SEED INSPECTION

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## CORN — (FIELD)

A-98	DELTA SALES CO., Williamson, N. Y. Big K Sweepstakes Seed Corn, Lot No. 17 Cutler Grain Co., Framingham	—	Trace	—	90 88	3/32 7/32
A-69	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Canada Leaming Hybrid Corn. Essex Co. Farmers' Ass'n., Topsfield	—	.75 .04	—	95 94	11/31 7/32
A-70	Improved Leaming Corn. Essex Co. Farmers' Ass'n., Topsfield	—	.50	—	93 92	3/32 7/32
A-150	ROSS BROS. CO., Worcester, Mass. Luce's Favorite Field Corn. Ross Bros. Co., Worcester	—	.60	—	90 64	12/31 7/32
A-151	Leaming Corn. Ross Bros. Co., Worcester	—	.02	—	94 75	2/32 7/32
A-152	Eureka Corn. Ross Bros. Co., Worcester	—	.33	—	98 94	3/32 7/32
A-164	Sweepstakes Corn. Ross Bros. Co., Worcester	—	—	—	94 95	2/32 7/32
A-165	Sheffield Corn. Ross Bros. Co., Worcester	—	—	—	98 92	1/32 7/32
A-137	F. H. WOODRUFF & SONS, Milford, Conn Improved Leaming Field Corn. H. Durant, Belchertown	—	—	—	96 92	* 7/32
A-88	WHOLESALE NOT NAMED Leaming Corn. Curley Bros. Grain Co., Wakefield	—	.21	—	* 53	* 7/32
A-129	JOSEPH BRECK & SONS CORP., Boston, Mass. New Zealand Cheving's Fescue. H. V. Lawrence, Falmouth	*	.05	—	95 17	* 8/32

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## FESCUES

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
FESCUES — Continued							
A-138	ALBERT DICKINSON CO., Chicago, Ill. Chewings Fescue, Lot 034104. Frank Howard, Pittsfield	(L. 97.90 F. 97.11)	.40 .19	— 2.12	— .58	40 11	2/32 8/32
A-161	ROSS BROS. CO., Worcester, Mass. Red Fescue. Ross Bros. Co., Worcester	(L. 94.00 F. 90.79)	* .24	— 8.78	— .19	91 52	1/32 8/32
A-132	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Red Fescue. H. V. Lawrence, Falmouth	(L. 95.59 F. 95.50)	.19 .19	— 4.31	— .00	80 82	1/32 8/32
MANGELS							
A-85	THOMAS W. EMERSON CO., Boston, Mass. M. L. Red Mangel. W. R. Hill Hardware, Andover	(L. * F. 99.37)	—	— .26	— .37	* 81	* 8/32
A-86	Giant Long Red Mangel. Fred Smith Hardware, Reading	(L. * F. 99.52)	—	— .48	—	* 70	* 8/32
A-109	FERRY-MORSE SEED CO., Detroit, Mich. Mangel Wurtzel Beets. Ralph W. Newdick Estate, Marshfield	(L. * F. 98.21)	—	— 1.79	—	* 70	* 7/32
A-107	PAGE SEED CO., Greene, N. Y. Mangel Wurtzel, Lot No. D7-7830. J. H. Fairbanks Co., Bridgewater	(L. * F. 99.33)	—	— .67	—	* 85	* 8/32
A-147	JEROME B. RICE SEED CO., Cambridge, N. Y. Mangel Wurtzel, Mammoth Long Red. A. L. Avery, Charlemon	(L. * F. 98.63)	* .03	— 1.21	— .13	* 76	* 8/32
A-158	ROSS BROS. CO., Worcester, Mass. Mangel, Mammoth Long Red. Ross Bros. Co., Worcester	(L. 98.00 F. 99.32)	.22 .08	.17 .52	— .08	84 75	1/32 7/32
GOLDEN MILLET							
A-49	THOMAS W. EMERSON CO., Boston, Mass. Golden Millet. W. D. Adlington Co., Saugus	(L. 90.00 F. 99.43)	.25 .10	— .47	—	90 5	1/28 7/32

A-66	Golden Millet. Poor & Co., Topsfield	(L. F.)	99.45	* .03	— .32	— .20	* 82	* 7/32
<b>HUNGARIAN MILLET</b>								
A-79	THOMAS W. EMERSON CO., Boston, Mass. Hungarian Millet. L. E. Smith Hardware, Gloucester	(L. F.)	98.50 98.65	.50 .77	.50 .46	.50 .12	88 67	2/28 7/32
A-94	Hungarian Millet. Lockhart Hardware Co., Natick	(L. F.)	96.95	* 1.75	— 1.27	— .03	* 71	* 7/32
A-104	NUNGESSER-DICKINSON SEED CO., New York, N. Y. Hungarian Millet, Lot No. 47113 J. Cushing Co., North Abington	(L. F.)	97.18 97.49	1.38 1.81	— .39	— .31	82 72	3/31 7/32
A-25	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Hungarian Millet. Ware Grain & Coal Co., Ware	(L. F.)	99.50 99.40	1.10 .44	— .16	— Trace	94 80	1/31 7/32
A-33	Fancy Hungarian Millet. Oxford Grain Co., Oxford	(L. F.)	98.97 98.75	.28 .17	— 1.08	— —	86 86	2/32 7/32
<b>JAPANESE MILLET</b>								
A-105	NUNGESSER-DICKINSON SEED CO., New York, N. Y. Japanese Millet, Lot No. 44127 J. Cushing Co., North Abington	(L. F.)	98.79 98.78	1.20 1.14	— .08	— —	86 81	2/32 7/32
A-142	PAGE SEED CO., Greene, N. Y. Japanese Millet. Frank Howard, Pittsfield	(L. F.)	95.00 99.41	1.10 .59	1.10 —	— —	85 78	1/32 7/32
A-162	ROSS BROS. CO., Worcester, Mass. Japanese Millet. Ross Bros. Co., Worcester	(L. F.)	99.50 95.91	.45 3.92	— 17	— Trace	94 91	1/32 7/32
A-24	N. WERTHEIMER & SONS, Buffalo, N. Y. Japanese Millet, Lot No. 31701 Ware Grain & Coal Co., Ware	(L. F.)	97.42 96.72	* 2.83	— .14	.36 .31	87 74	2/32 7/32

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A-50	THOMAS W. EMERSON CO., Boston, Mass. Fancy Red Top.....	(L. 90.40 F. 91.54)	.70 .45	— 7.73	— .28	90 85	* 7/82
A-63	W. D. Adlington Hardware, Saugus Red Top..... Poor & Co., Topsfield	(L. * F. 91.88)	* .68	— 7.18	— .26	* 87	* 7/32
A-77	Fancy Red Top..... L. E. Smith Hardware, Gloucester	(L. 91.00 F. 90.66)	1.40 .63	— 8.41	— .30	90 92	*32 8/32
A-91	Red Top..... Lockhart Hardware Co., Natick	(L. * F. 90.54)	* 1.40	— 8.00	— .06	* 86	* 7/32
A-117	Red Top..... Henry T. Crocker, Brewster	(L. * F. 92.37)	* 1.17	— 6.03	— .43	* 91	* 7/32
A-123	Redeanned Red Top..... Robert F. Cross, Osterville	(L. * F. 93.52)	* .70	— 5.48	— .30	* 93	* 7/32
A-125	Bay State Red Top..... C. T. Eastman, Falmouth	(L. 98.00 F. 97.86)	* .85	— 1.24	— .05	92 91	*31 7/32
A-102	NUNGESSER-DICKINSON SEED CO., New York, N. Y. Red Top, Lot No. 39195..... J. Cushing Co., North Abington	(L. 90.00 F. 89.81)	1.00 .96	— 9.11	— .12	90 92	3/31 7/32
A-35	ROSS BROS. CO., Worcester, Mass. Red Top, Lot No. 196..... LaPalme Hardware, Webster	(L. 90.00 F. 90.16)	.20 .32	— 9.39	— .13	* 89	* 1/29 7/32
A-28	STANFORD SEED CO., Buffalo, N. Y. Red Top..... Osborne Hardware Co., Holyoke	(L. 90.55 F. 90.14)	1.77 2.06	— 7.64	— .16	85.75 87	2/32 7/32
A-29	Unhulled Red Top..... Osborne Hardware Co., Holyoke	(L. 50.25 F. 40.73)	1.12 1.53	— 51.96	— 5.78	80 63	* 8/32
A-145	Red Top..... Platt & Goslee, Gt. Barrington	(L. 90.55 F. 90.91)	1.77 1.48	— 6.60	— .01	85.7 85.5	2/32 7/32
A-2	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Red Top..... O. C. Alderman, Springfield	(L. 91.00 F. 90.67)	2.05 1.36	— 7.91	— .06	90 90	* 4/32

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
RED TOP — Continued							
A-7	Red Top Frank, The Seedman, Springfield	(L. 92.00 F. 93.95)	.59 .46	— 5.26	— .33	90 96	* 4/32
A-43	Red Top Hutchinson's Hardware, Lynn	(L. * F. 90.54)	* 1.88	— 7.58	— Trace	* 88	* 7/32
A-48	Pan-American Red Top A. H. Whidden & Sons, Peabody	(L. 92.00 F. 90.99)	.77 1.17	— 4.03	— 3.81	90 92	9/30 7/32
A-110	Pan-American Red Top Phillips Bates & Co., Marshfield	(L. 92.00 F. 91.70)	1.45 1.82	— 6.39	— .09	90 86	8/31 7/32
A-135	Pan-American Red Top Ryther & Warren, Belchertown	(L. 92.00 F. 92.16)	1.99 1.42	— 6.37	— .05	90 89	2/32 7/32
A-128	F. H. WOODRUFF & SONS, Milford, Conn. Red Top Falmouth Plumbing & Hardware Co., Falmouth	(L. * F. 91.37)	* 1.65	— 6.53	— .45	* 92	* 7/32
A-6	WHOLESALE NOT NAMED (Purchased from a jobber) Red Top Auburn Hardware Co., Springfield	(L. 90.80 F. 91.33)	.90 .70	— 7.74	— .23	90 88	* 4/32
RYE							
A-95	THOMAS W. EMERSON CO., Boston, Mass. Kny's Choice Rosen Rye, Fiske Hardware Co., Natick	(L. 98.00 F. 97.43)	— .00	.50 1.51	1.50 1.06	92-96 87	* 7/32
A-106	NUNGESSER-DICKINSON SEED CO., New York, N. Y. Spring Rye, Lot No. 07445 J. Cushing Co., North Abington	(L. 97.54 F. 98.03)	.09 .02	— 1.87	— .08	87 80	3/32 7/32
A-154	ROSS BROS. CO., Worcester, Mass. Spring Rye, Ross Bros. Co., Worcester	(L. 99.00 F. 97.48)	.03 .02	— 2.03	— .47	85 84	2/32 7/32
A-82	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Spring Barley F. B. Keene Hardware, Amesbury (Rye)	(L. * F. 99.15)	* .12	— .70	— .03	* 0	* 7/32

## WHOLESALE NOT NAMED

A-87 Winter Rye.....  
Curley Bros. Grain Co., Wakefield

\* .02      2.86      .87      \* 85      \* 7/32

## RYEGRASS

ROSS BROS. CO., Worcester, Mass.  
Domestic Ryegrass.....  
Ross Bros Co., Worcester

\* .91      .42      .02      90 1/32  
92 7/32

## SUNFLOWER

JEROME B. RICE SEED CO., Cambridge, N. Y.  
Mammoth Russian Sunflower.....  
S. Allen & Son, Greenfield

— —      .14      —      \* 81      \* 7/32

## TIMOTHY

JOSEPH BRECK & SONS CORP., Boston, Mass.  
Prime Timothy.....  
B. F. Hill Hardware, Salem

\* .49      .85      .40      93 12/30  
78 7/32

A-60 Prime Timothy.....  
B. F. Hill Hardware, Salem

\* .44      .06      .39      93 \*  
82 7/32

A-114 Timothy.....  
C. L. Goodspeed, Dennis

\* .04      .10      .13      90 \*  
13 7/32

ALBERT DICKINSON CO., Chicago, Ill.  
Timothy, Lot No. 67169.....  
Frank Howard, Pittsfield

.05      .19      .02      95 8/31  
92 7/32

A-166 Timothy.....  
J. Cushing Co., Hudson

.05      .02      .04      94 2/32  
93 7/32

DOUGHTEN SEED CO., Jersey City, N. J.  
Timothy.....  
Dooley Hardware Co., Springfield

.02      .28      —      90 \*  
.10      .19      .05      91 6/32

EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.  
Timothy.....  
Essex County Farmers' Ass'n., Topsfield

.05      .29      .09      90 12/31  
.10      .34      .08      91 7/32

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
TIMOTHY — Continued							
A-51	THOMAS W. EMERSON CO., Boston, Mass. Timothy	98.00 (L. F. 99.85	.25 .02	— .12	— .01	90 90	*31 7/32
A-67	W. D. Adlington Hardware, Saugus Timothy	* (L. F. 98.26	* .16	— .70	— .88	* 88	* 7/32
A-92	Poor & Co., Topsfield Timothy	* (L. F. 99.61	* .02	— .25	— .12	* 92	* 7/32
A-116	Lockhart Hardware Co., Natick Timothy	* (L. F. 99.00	* .16	— .68	— .16	* 93	* 7/32
A-118	Henry T. Crocker, Brewster Timothy	* (L. F. 98.09	* .21	— .89	— .81	* 86	* 7/32
A-126	Myron G. Bradford, Hyannis Bay State Timothy	* (L. F. 99.00	* .02	— .08	— .22	95 96	*32 7/32
A-103	C. T. Eastman, Falmouth NUNGESSER-DICKINSON SEED CO., New York, N. Y. Timothy, Lot No. 67880	99.65 (L. F. 99.81	.05 .02	— .11	— .06	94 93	2/32 7/32
A-30	J. Cushing Co., North Abington STANFORD SEED CO., Buffalo, N. Y. Timothy	99.65 (L. F. 99.63	.05 .03	— .18	— .16	92 93	2/32 7/32
A-168	Osborne Hardware Co., Holyoke JOHN B. VARICK, Manchester, N. H. Timothy	99.65 (L. F. 99.80	.05 .04	— .13	— .03	94 93	8/31 7/32
A-20	A. E. Stewart, Athol N. WERTHEIMER & SONS, Buffalo, N. Y. Timothy	99.84 (L. F. 99.75	.04 .02	.10 .21	.02 .02	94 94	2/32 7/32
A-23	Warren Grain Co., Warren Timothy, Lot No. 31522	99.84 (L. F. 99.63	* .04	— .29	.02 .04	94 94	2/32 7/32
A-4	Ware Grain & Coal Co., Ware WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Timothy	99.00 (L. F. 99.49	.05 .03	— .43	— .05	92 92	* 4/32
	O. C. Alderman, Springfield						

A-8	Timothy Frank, The Seedman, Springfield	(L. F.)	99.60 99.47	.05 .06	— .18	— .29	90 96	* 4/32
A-12	Pan-American Timothy Hall & Torrey Co., Rockland	(L. F.)	99.60 99.72	* .05	— .20	— .03	90 92	* 7/32
A-15	Pan-American Timothy Carlisle Hardware Co., Springfield	(L. F.)	99.60 99.74	.10 .03	.10 .11	.12	92 42	1/28 7/32
A-31	Frontier Timothy Oxford Grain Co., Oxford	(L. F.)	98.00 99.01	1.10 .10	— .76	— .13	90 91	8/31 7/32
A-41	Timothy Hutchinson's Hardware, Lynn	(L. F.)	* 99.69	* .06	— .21	— .04	* 95	* 7/32
A-47	Herald Timothy A. H. Whidden & Sons, Peabody	(L. F.)	98.10 98.42	.23 .33	— .80	— .45	90 91	2/31 7/32
A-53	Timothy Treat Hardware Co., Lawrence	(L. F.)	* 99.62	* .02	— .21	— .15	84.25 90	4/32 7/32
A-54	Timothy Treat Hardware Co., Lawrence	(L. F.)	* 99.56	* .01	— .22	— .21	84.25 87	4/32 7/32
A-58	Pan-American Timothy Villeneuve Hardware Co., Haverhill	(L. F.)	99.60 99.75	.05 .05	— .16	— .04	90 93	2/32 7/32
A-127	F. H. WOODRUFF & SONS, Milford, Conn. Timothy Falmouth Plumbing & Hardware Co., Falmouth	(L. F.)	* 99.81	* .05	— .14	Trace	* 91	* 7/32
A-5	WHOLESALE NOT NAMED (Purchased from a jobber) Timothy Auburn Hardware Co., Springfield	(L. F.)	99.65 99.80	.05 .03	— .08	— .09	94 93	* 4/32
A-143	Timothy Haskell-Broderick Co., Lenox	(L. F.)	* 99.48	* .02	— .24	— .26	* 94	* 7/32
WOOD MEADOW GRASS								
A-130	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Wood Meadow Grass H. V. Lawrence, Falmouth	(L. F.)	83.79 82.92	2.18 2.32	— 14.40	— .36	80 76	1/32 7/32

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The \* shows the violation in labeling.

Boldface type indicates low purity, low germination, excessive weed seed, or excessive inert matter, depending upon the column in which it is found.

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>MIXTURES</b>							
A-90	JOSEPH BRECK & SONS CORP., Boston, Mass.						
	Kentucky Bluegrass*.....	(L. *	*	-	-	*	*
	Grace Hardware Co., Wakefield						
A-112	Kentucky Bluegrass and Red Top	Kentucky Bluegrass (F. 71.89 Red Top (F. 12.76				94 81	7/32 7/32
		84.65	.42	14.85	.08		
	Choice White Clover*.....	(L. 97.00	*	-	-	90	*
	Phillips Bates & Sons, Boston						
	White Clover and Alsike	White Clover (F. 92.39 Alsike (F. 5.50				86-1 80-6	7/32 7/32
A-38	DURYEA SEED CO., New York, N. Y.	97.89	1.39	.53	.19		
	White Clover*.....	(L. 86.00	.83	18.00	-	76	2/32
	Dooley Hardware Co., Springfield						
	White Clover and Alsike	White Clover (F. 88.48 Alsike (F. 10.00				71-14 45-12	7/32 7/32
		98.48	.65	.74	.13		

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES</b>					
C-8	ATLANTIC GRASS SEED CO., New York, N. Y.				
	Wonderlawn Grass Seed.....(L.)	—	1.00	19.50	—
	(Ingredients Not Named)*				
	H. A. Spear Hardware, Walpole.....(F.)	83.70	.54	15.64	.12
	Domestic Ryegrass.....	52.97			
C-10	Red Top.....	17.65			
	Kentucky Bluegrass.....	13.08			
	JOSEPH BRECK & SONS CORP., Boston, Mass.				
	Breck's Good Grade Grass Seed Mixture.....(L.)	93.00	1.00	6.00	—
	(Ingredients Not Named)*				
C-11	Winer's Hardware Stores, 1350 Hancock St., Quincy.....(F.)	95.31	.27	4.19	.23
	Domestic Ryegrass.....	49.34			
	Timothy.....	38.49			
	Red Top.....	4.74			
	White Clover.....	2.74			
C-19	Lawn Grass Mixture.....(L.)	—	1.00	29.00	—
	Red Top.....	5.00			
	Domestic Ryegrass.....	30.00			
	Timothy.....	34.00			
	White Clover.....	1.00			
C-19	Edwards Hardware Co., 1627 Hancock St., Quincy.....(F.)	73.51	1.27	24.77	.45
	Domestic Ryegrass.....	33.56			
	Timothy.....	21.33			
	Red Top.....	16.72			
	White Clover.....	1.90			
C-19	Setab Lawn Grass Seed Mixture.....(L.)	—	*	*	—
	(Ingredients Not Named)*				
	J. H. Ivory, North Brookfield.....(F.)	92.37	.62	7.01	Trace
	Red Top.....	69.02			
	Kentucky Bluegrass.....	4.29			
C-19	Timothy.....	14.08			
	White Clover.....	4.98			

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued					
JOSEPH BRECK & SONS CORP.—Continued					
C-26	Lawn Seed Mixture.....	(L. 91.47	.27	8.27	-
	Red Top, Timothy, Kentucky Bluegrass, White Clover				
	Webster Grain Co., Webster.....	(F. 90.15	.29	9.25	.31
	Red Top.....	68.43			
	Timothy.....	13.32			
C-31	Kentucky Bluegrass.....	4.56			
	White Clover.....	3.84			
	Breck's Special Setab Brand Lawn Grass Seed Mixture.....	(L. 94.00	1.00	4.69	-
	Clean Red Top, Kentucky Bluegrass, Timothy, White Clover				
	Phillips Bates & Co., Marshfield.....	(F. 93.21	1.28	5.39	.12
C-37	Red Top.....	65.07			
	Kentucky Bluegrass.....	3.60			
	Timothy.....	19.19			
	White Clover.....	5.35			
	Breck's Special Lawn Grass Seed Mixture.....	(L. -	1.00	4.69	-
C-38	Clean Red Top, Timothy, Kentucky Bluegrass, White Clover				
	John E. Jordan Co., Plymouth.....	(F. 93.33	1.04	5.48	.15
	Red Top.....	62.79			
	Timothy.....	15.87			
	Kentucky Bluegrass.....	8.71			
C-39	White Clover.....	5.96			
	Breck's Shady Spot Lawn Grass.....	(L. 73.40	1.15	25.45	-
	Kentucky Bluegrass, Rough Stalked Meadow Grass, Fescue,* Red Top				
	John E. Jordan Co., Plymouth.....	(F. 81.30	.83	17.56	.31
	Red Top.....	26.89			
C-39	Rough Stalked Meadow Grass.....	34.72			
	Wood Meadow Grass (4).....	10.35			
	Kentucky Bluegrass.....	6.81			
	Fine-leaved Fescue.....	2.53			
	Breck's Boston Park Lawn Seed.....	(L. 91.00	1.00	7.00	-
C-39	Kentucky Bluegrass, Red Top, Meadow Fescue, White Clover, Perennial Ryegrass				
	J. H. Davidson Estate, Dennis.....	(F. 88.88	.86	10.15	.11
	Kentucky Bluegrass.....	36.28			
	Red Top.....	36.13			
	Meadow Fescue.....	7.59			
C-39	Perennial Ryegrass.....	6.33			
	White Clover.....	2.16			
	White Clover.....	1.91			
	White Clover.....	1.91			
	White Clover.....	1.91			

C-40	Breck's Park Lawn Seed. (Ingredients Not Named)* C. L. Goodspeed, Dennis. Red Top. Kentucky Bluegrass. English Perennial Ryegrass. Meadow Fescue. White Clover.	(L. (F. 42.99 35.56 6.57 4.64 2.63	91.00 92.39	1.00 .99	7.00 6.51	— .11
C-2	THOMAS W. EMERSON CO., Boston, Mass. Grass Seed Mixture. Chewings Fescue*. Red Top, Kentucky Bluegrass, Timothy, German Bent, White Clover Maschin & Kratovil, 463 State St., Springfield. Agrostis spp. (Red Top and German Bent) Kentucky Bluegrass. Timothy. Domestic Ryegrass (4). White Clover. Chewings Fescue.	(L. (F. 26.91 22.33 20.64 14.47 6.74 2.17	— 93.25	.40 .56	8.50 5.48	— .70
C-28	Gem Lawn Seed. (Ingredients Not Named)* Gove Hardware Co., Amesbury. Agrostis spp. (Red Top and German Bent). Timothy. Kentucky Bluegrass. Chewings Fescue. White Clover.	(L. (F. 44.64 19.04 15.52 11.24 1.71	— 92.15	.40 .50	8.50 7.28	— .07
C-29	Shady Lawn Seed. Red Top, Kentucky Bluegrass, Chewings Red Fescue, Rough Stalked Meadow Grass, White Clover, German Bent Lockhart Hardware Co., Natick. Agrostis spp. (Red Top and German Bent). Kentucky Bluegrass. Rough Stalked Meadow Grass. Red Fescue. White Clover.	(L. (F. 41.02 21.75 13.16 9.88 4.57	— 90.38	.50 .74	5.63 7.64	— 1.24

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued					
THOMAS W. EMERSON CO.—Continued					
C-35	Gem Lawn Seed.....	—	.40	8.50	—
	Chewings Red Fescue, Red Top, Kentucky Bluegrass, Timothy, German Bent, White Clover	(L.)			
	Plymouth Rock Hardware Co., Plymouth.				
	Agrostis spp. (Red Top and German Bent)	(F.)	1.40	5.87	.76
	Kentucky Bluegrass.....	24.64			
	Timothy.....	19.24			
	Domestic Ryegrass (4).....	18.81			
	White Clover.....	17.47			
	Chewings Red Fescue.....	4.49			
	Chewings Red Fescue.....	7.82			
C-41	Special Mixed Lawn Seed.....	(L.)	.50	4.30	—
	Red Top, Kentucky Bluegrass, Chewings Fescue, White Clover, German Bent				
	Myron G. Bradford, Hyannis.....	(F.)	.86	7.01	.02
	Agrostis spp. (Red Top and German Bent)				
	Kentucky Bluegrass.....	59.96			
	Chewings Fescue.....	18.75			
	White Clover.....	9.09			
	White Clover.....	4.31			
	Special Mixed Lawn Seed.....	(L.)	.50	4.30	—
	Red Top, Kentucky Bluegrass, Chewings Red Fescue, White Clover, German Bent				
C-45	Robert F. Cross, Osterville.....	(F.)	92.25	6.49	.24
	Agrostis spp. (Red Top and German Bent)				
	Kentucky Bluegrass.....	58.41			
	Chewings Fescue.....	20.19			
	White Clover.....	10.07			
	White Clover.....	3.58			
	Permanent Pasture Mixture.....	(L.)	*	*	—
	Red Top, Bluegrass*, Timothy, White Clover, Alsike Clover, Ryegrass*				
	Robert F. Cross, Osterville.....	(F.)	.81	5.23	.09
	Timothy.....	23.91			
C-47	Red Top.....	23.70			
	Kentucky Bluegrass.....	22.12			
	Domestic Ryegrass.....	14.00			
	White Clover.....	5.55			
	Alsike Clover.....	4.59			
	Special Mixed Lawn Seed.....	(L.)	.50	4.30	—
	Kentucky Bluegrass, Chewings Red Fescue, White Clover, German Bent, Red Top				
	Robert F. Cross, Osterville.....	(F.)	.81	5.23	.09
	Timothy.....	23.91			
	Red Top.....	23.70			
C-48	Kentucky Bluegrass.....	22.12			
	Domestic Ryegrass.....	14.00			
	White Clover.....	5.55			
	Alsike Clover.....	4.59			
	Special Mixed Lawn Seed.....	(L.)	.50	4.30	—
	Kentucky Bluegrass, Chewings Red Fescue, White Clover, German Bent, Red Top				
	Robert F. Cross, Osterville.....	(F.)	.81	5.23	.09
	Timothy.....	23.91			
	Red Top.....	23.70			
	Kentucky Bluegrass.....	22.12			

C-7	C. T. Eastman, Falmouth.....	(F.)	91.62	.92	6.97	49
	Agrostis spp. (Red Top and German Bent)		61.53			
	Kentucky Bluegrass.....		16.78			
	Red Fescue.....		6.82			
	White Clover.....		6.49			
C-12	J. OLIVER JOHNSON CO., Chicago, Ill.					
	Lincoln Park Lawn Seed.....	(L.)	-	1.00	21.00	-
	(Ingredients Not Named)*					
	Milne's Hardware, Walpole.....	(F.)	87.77	1.40	10.29	.54
	Red Top.....		33.97			
	Timothy.....		25.94			
	Kentucky Bluegrass.....		11.25			
	Domestic Ryegrass.....		8.97			
	White Clover.....		4.38			
	Red Fescue.....		3.26			
C-18	Grass Seed Mixture.....	(L.)	-	1.00	19.00	-
	Kentucky Bluegrass.....		20.00			
	Pancy Red Top.....		35.00			
	Timothy.....		20.00			
	White Clover.....		5.00			
	Edwards Hardware Co., 1627 Hancock St., Quincy.....	(F.)	75.84	.87	22.85	.44
	Red Top.....		38.79			
	Timothy.....		23.77			
	Kentucky Bluegrass.....		12.26			
	White Clover.....		1.02			
C-18	PAGE SEED CO., Greene, N. Y.					
	Page's Marvelawn Lawn Grass (2).....	(L.)	84.48	3.10	11.96	.06
	Red Top, Timothy, Domestic Ryegrass, Kentucky Bluegrass, White Clover 2.8%, Canada Bluegrass .52%					
	Fullam Hardware Co., North Brookfield.....	(F.)	93.99	.66	5.35	Trace
	Domestic Ryegrass.....		23.81			
	Red Top.....		22.73			
	Timothy.....		19.42			
	Rough Stalked Meadow Grass.....		14.36			
	Kentucky Bluegrass.....		8.70			
	White Clover.....		4.97			

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Wholesale Distributor, Brand or Trade Name of Mixture,  
Dealer, Place Collected, Name and Percentage  
of Ingredients in each Mixture

Lab. No.	PAGE SEED CO.—Continued	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
C-22	Lawn Grass Seed.....	(L. 93.46	.77	5.77	-
	Red Top.....	26.00			
	Kentucky Bluegrass.....	15.00			
	Meadow Fescue.....	2.00			
	Perennial Ryegrass.....	8.00			
	Timothy.....	20.00			
	Rough Stalked Meadow Grass.....	11.00			
	White Clover.....	5.00			
	Domestic Ryegrass.....	2.00			
	Sheep's Fescue.....	3.00			
	J. F. Robinson Co., Ware.....	(F. 93.40	.71	5.81	.08
	Red Top.....	25.98			
	Timothy.....	21.59			
	Kentucky Bluegrass.....	15.84			
C-25	Rough Stalked Meadow Grass.....	13.75			
	Perennial Ryegrass.....	5.73			
	White Clover.....	4.86			
	Sheep's Fescue.....	2.59			
	Meadow Fescue.....	1.88			
	Domestic Ryegrass.....	1.18			
	Lawn Grass Seed.....	(L. 95.35	.61	3.94	.10
	Red Top.....	25.00			
	Kentucky Bluegrass.....	15.00			
	Meadow Fescue.....	5.00			
	Perennial Ryegrass.....	15.00			
	Rough Stalked Meadow Grass.....	13.00			
	White Clover.....	5.00			
	Unhulled Red Top.....	2.00			
Avery M. Burlingame, Oxford	Red Top.....	(F. 94.32	.60	4.89	.19
	Rough Stalked Meadow Grass.....	23.20			
	Kentucky Bluegrass.....	11.47			
	Timothy (4).....	13.56			
	Perennial Ryegrass.....	19.38			
	White Clover.....	16.76			
	Meadow Fescue.....	5.98			
	.....	3.97			

C-1	PEDIGREED SEED CO., New York, N. Y.				
	Marvellawn.....	(L.)	1.00	11.00	-
	Domestic Ryegrass, Timothy, Red Top, White Clover 2 %			14.00	
	Kuzon Bros., 1919 Main St., Springfield.....	(F.)	.43	16.16	1.42
	Domestic Ryegrass.....				
C-3	Red Top.....				
	Timothy.....				
	White Clover.....				
	Bowling Green Mixture.....				
	Red Top, Fescue*, Timothy 5 % Kentucky Bluegrass, White Clover 5 %	(L.)	Less than 1.00	11.00	-
C-9	Kuzon Bros., 1919 Main St., Springfield.....	(F.)	86.71	12.22	.07
	Timothy.....				
	Red Top.....				
	Kentucky Bluegrass.....				
	Red Fescue.....				
C-13	White Clover.....				
	Bowling Green Lawn Grass.....	(L.)	Less than 1.00	11.00	-
	(Ingredients Not Named)*				
	Gilbert Hardware Co., Medfield.....	(F.)	87.46	11.20	.03
	Timothy.....				
C-20	Red Top.....				
	Kentucky Bluegrass.....				
	Red Fescue.....				
	White Clover.....				
	Grass Seed Mixture.....	(L.)	1.00	11.00	-
C-20	Red Top, Fescue*, Timothy, Kentucky Bluegrass, White Clover 5 %	(F.)	88.32	10.62	-
	G. W. Stone Co., 33 Washington Square, Weymouth.....				
	Timothy.....				
	Red Top.....				
	Chewings Fescue.....				
C-20	Kentucky Bluegrass.....				
	White Clover.....				
	Bowling Green Lawn Seed.....	(L.)	Less than 1.00	Approx. 11.00	-
	Red Top, Fescue sp., Timothy, Kentucky Bluegrass, White Clover 5 %	(F.)	83.26	15.36	.04
	P. A. Richard Hardware, Spencer.....	(R.)	83.02	15.31	.07
C-20	Timothy.....				
	Red Fescue.....				
	Red Top.....				
	Kentucky Bluegrass.....				
	White Clover.....				

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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued					
PEDIGREED SEED CO.—Continued					
C-32	Lawn Grass Seed.....	—	Less than 1.00	10.00	—
	Red Top, Fescue sp., Timothy, Kentucky Bluegrass, White Clover 5 %	(L.			
	Sherman Hardware & Furniture Co., No. Plymouth	(F.			.22
	Timothy.....	(R.			.17
	Red Top.....	58.94			
	Red Top.....	13.79			
	Red Fescue.....	13.43			
	Domestic Ryegrass.....	9.07			
	Kentucky Ryegrass.....	3.23			
	White Clover.....	1.31			
	White Clover.....	1.20			
ROSS BROS. CO., Worcester, Mass.					
C-15	Shady Lawn Seed.....	—	.56	10.32	—
	South German Bent, Red Top, Kentucky Bluegrass,	(L.			
	Rough Stalked Meadow Grass, Red Fescue				
	A. S. Tucker, Warren.....	(F.			.04
	Agrostis spp. (Red Top and German Bent)	54.14			
	Kentucky Bluegrass.....	18.06			
	Rough Stalked Meadow Grass.....	8.38			
	Red Fescue.....	8.48			
C-16 Bank and Lawn Mixture.					
	Ryegrass*, Canada Bluegrass, Red Top, Red Fescue, Creeping Bent*	(L.	.30-1.70	*	—
	A. S. Tucker, Warren.....	(F.			.66
	Agrostis spp. (Red Top and German Bent)	22.39			
	Canada Bluegrass.....	35.62	.44	9.59	
	Red Fescue.....	17.23			
	Domestic Ryegrass.....	14.07			
STANFORD SEED CO., Buffalo, N. Y.					
C-24	City Mixed Lawn Seed.....	—	1.00	16.00	—
	White Clover, Kentucky Bluegrass, Red Top, Timothy	(L.			
	Osborne Hardware Co., Holyoke.....	(F.			Trace
	Red Top.....	38.28	.41	13.22	
	Timothy.....	20.03			
	White Clover.....	15.14			
	Kentucky Bluegrass.....	12.92			

## SEED INSPECTION

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## SUPPLE-BIDDLE HARDWARE CO., Philadelphia, Pa.

C-21	Valley Green Lawn Seed	(L.)	1.10	19.00	-
	Red Top, Kentucky Bluegrass, Ryegrass*, Timothy, White Clover	(F.)	.50	18.71	2.11
	J. F. Robinson Co., Ware				
	Timothy				
	Domestic Ryegrass			42.24	
	Red Top			15.76	
	Kentucky Bluegrass			8.80	
	White Clover			6.24	
				5.64	

## N. WERTHEIMER &amp; SONS, Buffalo, N. Y.

C-17	Lawn Grass	(L.)	1.00	14.00	-
	Bluegrass*			40.00	
	Red Top			35.00	
	Ryegrass*			5.00	
	White Clover			5.00	
	Warren Grain Co., Warren	(F.)	.69	13.00	4.35
	Kentucky Bluegrass			41.06	
	Red Top			21.69	
	Domestic Ryegrass			11.13	
	White Clover			8.08	

## WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.

C-4	Eureka Best Lawn Seed	(L.)	.60	8.00	2.00
	Kentucky Bluegrass, Fancy Red Top, White Clover, Chewings Fescue, Bent Grass (1)	(F.)	.92	10.84	.16
	Norwood Hardware, Norwood	(R.)	.83	11.09	.20
	Red Top			53.09	
	Kentucky Bluegrass			24.48	
	Chewings Fescue			5.68	
	White Clover			4.83	

C-5	Standard Lawn Seed	(L.)	2.00	18.00	2.00
	Red Top, Canada Bluegrass, Timothy, Domestic Ryegrass, White Clover 2%	(F.)	1.99	20.07	.21
	Norwood Hardware, Norwood				
	Domestic Ryegrass			30.80	
	Timothy			22.39	
	Red Top			10.37	
	Canada Bluegrass			9.85	
	White Clover			4.32	

Note.—The letters "L" and "F" indicate "Labeled" by the distributor and "Found" by the laboratory. "R" denotes a retest. The \* shows the violation in labeling. (2) Does not conform to formula. Boldface type indicates excessive weed seed or excessive inert matter, depending upon the column in which it is found. (1) Declared but not found.

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued					
WHITNEY-ECKSTEIN SEED CO.—Continued					
-6	Victoria Park Lawn Seed.....	(L.)	1.25	12.00	2.00
	Red Top, Kentucky Bluegrass, White Clover, Fescue spp., Domestic Ryegrass				
	Norwood Hardware, Norwood.....	(F.)	1.27	10.72	.41
	Red Top.....				
	Kentucky Bluegrass.....	37.46			
	Domestic Ryegrass.....	32.30			
	Meadow Fescue.....	6.90			
	White Clover.....	5.76			
	White Clover.....	5.18			
C-23					
	Lawn Seed (2).....	(L.)	1.30	12.00	4.50
	English Ryegrass.....	5.40			
	Timothy.....	26.50			
	Kentucky Bluegrass.....	14.10			
	Meadow Fescue.....	21.10			
	White Clover.....	4.50			
	Red Top.....	10.10			
	Crested Dogtail.....	5.00			
	J. B. Sibley & Son, Ware.....	(F.)	1.17	9.28	.00
	Red Top.....	45.33			
	Kentucky Bluegrass.....	12.81			
	Timothy.....	11.26			
	Canada Bluegrass.....	8.92			
	White Clover.....	6.76			
	Fescue (Prob. Chewings).....	4.39			
C-42					
	City Park Lawn Grass (3).....	(L.)	1.50	16.00	3.00
	Red Top, Canada Bluegrass, Domestic Ryegrass, Timothy, White Clover 3%				
	Hyannis Hardware Co., Hyannis.....	(F.)	1.41	16.77	.87
	Red Top.....				
	Canada Bluegrass.....	23.66			
	Domestic Ryegrass.....	15.83			
	Timothy.....	15.69			
	White Clover.....	22.71			
	White Clover.....	3.36			

## F. H. WOORDEUFF &amp; SONS, Milford, Conn.

C-14	Grass Seed Mixture. (Ingredients Not Named)*	L.	F.	L.	F.	L.	F.
	G. W. Stone Co., 33 Washington St., Weymouth.		80.83		.95	*	*
	Red Top.	32.95			17.27		.95
	Domestic Ryegrass.	27.18					
	Kentucky Bluegrass.	11.45					
	Chewings Fescue.	5.15					
	White Clover.	4.10					
C-43	Milford Green Lawn Grass Seed.				1.00	16.00	-
	Kentucky Bluegrass, Red Top, Timothy.						
	Meadow Fescue, Domestic Ryegrass, White Clover						
	Central Hardware, Hyannis.		84.82		1.10	14.08	Trace
	Red Top.	30.79					
	Kentucky Bluegrass.	17.70					
	Timothy.	10.86					
	Meadow Fescue.	10.84					
	Domestic Ryegrass.	8.18					
	White Clover.	6.45					

Note:—The letters "L" and "F" indicate "Labeled" by the distributor and "Found" by the laboratory.

"R" denotes a retest. The \* shows the violation in labeling. (2) Does not conform to formula. (3) 5 Canada Thistle found in 30 grams seed.

Boldface type indicates excessive weed seed or excessive inert matter, depending upon the column in which it is found.

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
<b>BEANS</b>			
D-255	BERKSHIRE COAL & GRAIN CO., North Adams, Mass. Improved Golden Wax Beans..... Fred O. Bicknell, Charlemont	67	June
D- 58	JOSEPH BRECK & SONS CORP., Boston, Mass. Kentucky Wonder Wax Pole Beans..... Winer's Hardware Stores, 1350 Hancock St., Quincy	95	June
D- 61	Imperial Golden Wax Beans..... Winer's Hardware Stores, 1350 Hancock St., Quincy	86	June
D- 86	Black Wax Beans..... J. H. Ivory Hardware, North Brookfield	90	July
D-103	Burpee's Stringless Beans..... Lynn Bird & Seed Store, Oxford St., Lynn	87	June
D-104	Long Yellow Six Weeks Beans..... Lynn Bird & Seed Store, Oxford St., Lynn	90	June
D-116	Horticultural Pole Beans..... J. R. Smith Hardware, Gloucester	80	June
D- 25	THOMAS W. EMERSON CO., Boston, Mass. Pole Kentucky Wonder Beans..... H. A. Spear Hardware, Walpole	87	June
D- 26	Pole Horticultural Beans..... H. A. Spear Hardware, Walpole	88	June
D- 41	Kentucky Wonder Pole Beans..... C. A. Smith, Millis	85	June
D- 43	Long Yellow Six Weeks Beans..... C. A. Smith, Millis	80	June
D-119	Bountiful Bush Beans..... L. E. Smith Hardware, Gloucester	86	June
D-152	Improved Golden Wax Beans..... W. R. Hill Hardware, Andover	83	June
D-180	Lowe's Champion Bush Beans..... Fiske Hardware Co., Natick	40	June
D-215	Pencil Pod Black Wax Beans..... Plymouth Rock Hardware Co., Plymouth	88	June
D-219	Long Yellow Six Weeks Beans..... Henry T. Crocker, Brewster	87	June
D- 75	CHAS. C. HART SEED CO., Wethersfield, Conn. Pencil Pod Black Wax Beans..... Chapin & Clark Hardware Co., West Springfield	90	July
D-133	LEONARD SEED CO., Chicago, Ill. Lowe's Champion Beans..... F. B. Keene Hardware, Amesbury	51	June
D- 87	PAGE SEED CO., Greene, N. Y. Dwarf Horticultural Beans..... Fullam Hardware Co., North Brookfield	89	June
D- 15	JEROME B. RICE SEED CO., Cambridge, N. Y. Dwarf Rust-Proof Golden Wax Beans..... Norwood Hardware, Norwood	91	June
D- 64	Burpee's Stringless Green Pod Beans..... Hall & Torrey Co., 265-267 Union St., Rockland	90	June
D- 65	Long Yellow Six Weeks Beans..... Hall & Torrey Co., Rockland	83	June
D-239	Imperial Golden Wax Beans..... Newcomb Hardware Co., Conway	93	June
D-240	Pencil Pod Black Wax Beans..... Newcomb Hardware Co., Conway	82	June

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
<b>BEANS — Continued</b>			
<b>JEROME B. RICE SEED CO. — Continued</b>			
D-256	Dwarf Horticultural ..... J. A. Wells, Charlemont	78	June
D-257	Burpee's Stringless Green Pod Beans ..... S. Allen & Son, Greenfield	86	June
D-206	F. H. WOODRUFF & SONS, Milford, Conn. Burpee's Stringless Green Pod Beans ..... A. S. Barstow, Marshfield	82	June
D-232	Burpee's Stringless Green Pod Beans ..... Haskell-Broderick Co., Lenox	86	July
D- 77	<b>WHOLESALE NOT NAMED</b> Horticultural Pole Beans ..... E. C. Bradway, Monson	87	July
<b>BEETS</b>			
D- 57	<b>JOSEPH BRECK &amp; SONS CORP., Boston, Mass.</b> Crosby's Egyptian Beets. .... Winer's Hardware Stores, 1350 Hancock St., Quincy	65	June
D-115	Swiss Chard Beet. .... J. R. Smith Hardware, Gloucester	74	June
D-136	Dewings Blood Beet. .... Smith Grain Co., Amesbury	69	June
D-218	Dewings Early Blood Beet. .... C. L. Goodspeed, Dennis	85	June
D- 46	<b>CONTINENTAL NURSERIES, Franklin, Mass.</b> Early Blood Turnip Beet. .... A. J. Cataldo & Sons, Inc., Franklin	81	June
D-120	<b>THOMAS W. EMERSON CO., Boston, Mass.</b> Crosby's Egyptian Beet. .... L. E. Smith Hardware, Gloucester	72	June
D-223	Dewings Beet. .... Myron G. Bradford, Hyannis	70	June
D-157	<b>EMPIRE SEED CO., Fredonia, N. Y.</b> Detroit Dark Red Beet. .... L. M. Johnson, Reading	73	June
D-222	<b>FERRY-MORSE SEED CO., Detroit, Mich.</b> Early Blood Turnip Beet. .... Henry T. Crocker, Brewster	80	June
D- 80	<b>LAKE SHORE SEED CO., Dunkirk, N. Y.</b> Improved Blood Red Beet. .... T. Jacobs, Monson	61	June
D-159	Dewings Improved Blood Red Beet. .... Fred Smith Hardware Co., Reading	68	June
D- 13	<b>LEONARD SEED CO., Chicago, Ill.</b> Crosby's Egyptian Beet. .... Norwood Hardware, Norwood	54	June
D- 36	<b>JEROME B. RICE SEED CO., Cambridge, N. Y.</b> Detroit Dark Red Beet. .... W. A. Fitts, Medfield	63	June
D- 70	Detroit Dark Red Beet. .... A. M. Brainerd, 255 Union St., Rockland	75	June
D-179	Eclipse Blood Turnip Beet. .... Lockhart Hardware Co., Natick	61	June
D-209	Crosby's Dark Red Beet. .... A. S. Barstow, Marshfield	80	June
D-258	Crosby's Egyptian Beet. .... S. Allen & Son, Greenfield	79	July

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
<b>BEETS — Continued</b>			
D- 82	ROSS BROS. CO., Worcester, Mass. Early Blood Turnip Beet..... A. S. Tucker, Warren	81	June
D-221	Crosby Early Egyptian Beet..... Henry T. Crocker, Brewster	59	June
D- 3	F. H. WOODRUFF & SONS, Milford, Conn. Woodruff's Early Wonder Beets..... Frank, The Seedman, Springfield	75	April
D- 97	S. D. WOODRUFF & SONS, Orange, Conn. Long Red Mangel Beet..... Holyoke Farm Machinery Co., Holyoke	66	June
D-202	Edmonds Blood Beet..... J. H. Fairbanks Co., Central Square, Bridgewater	71	June
D- 78	WHOLESALE NOT NAMED Detroit Dark Red Beet..... E. C. Bradley, Monson	81	June
<b>CABBAGE</b>			
D-107	JOSEPH BRECK & SONS CORP., Boston, Mass. Drumhead Savoy Cabbage..... Lynn Bird & Seed Store, Oxford St., Lynn	92	July
D-175	Jersey Wakefield Cabbage..... Grace Hardware Co., Wakefield	63	July
D- 23	THOMAS W. EMERSON CO., Boston, Mass. Large Late Flat Dutch Cabbage..... Milne's Hardware Co., Walpole	91	July
D- 38	Fottlers Improved Brunswick Cabbage..... C. A. Smith, Millis	59	July
D-153	Stone Mason Drumhead Cabbage..... W. R. Hill Hardware, Andover	89	July
D-129	HAWKINS SEED CO., Reading, Vt. Hollander or Danish Ball Head Cabbage..... H. F. Davis Hardware, Merrimac	87	July
D- 91	D. LANDRETH & CO., Bristol, Pa. Danish Round Short Stem Cabbage..... P. A. Richard Hardware Co., Spencer	87	July
D-110	LEONARD SEED CO., Chicago, Ill. Improved American Savoy Cabbage..... Standard Hardware, Peabody	94	July
D-224	NORTHROP, KING & CO., Minneapolis, Minn. Early Jersey Wakefield Cabbage..... Central Hardware Co., Hyannis	75	July
D-204	PAGE SEED CO., Greene, N. Y. Danish Ball Head Cabbage, Lot No. E1-1831..... J. H. Fairbanks, Co., Bridgewater	85	July
D-138	ROSS BROS., CO., Worcester, Mass. All Season Cabbage..... Smith Grain Co., Amesbury	83	July
D- 9	F. H. WOODRUFF & SONS, Milford, Conn. Copenhagen Market Cabbage, 1932..... Frank, The Seedman, Springfield	90	March
D-194	Drumhead Savoy Cabbage..... Boston Supply Co., Framingham	92	July



## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
<b>CARROTS</b>			
D- 59	JOSEPH BRECK & SONS CORP., Boston, Mass. Danvers Half Long Carrots..... Winer's Hardware Store, 1350 Hancock St., Quincy	85	June
D- 48	CONTINENTAL NURSERIES, Franklin, Mass. Early Oxheart Carrot..... A. J. Cataldo & Sons, Franklin	27	June
D-244	CROSSMAN SEED CO., East Rochester, N. Y. Early Scarlet Short Horn Carrot..... Geo. G. Henry, Ashfield	48	June
D-121	THOMAS W. EMERSON CO., Boston, Mass. Danvers Half Long Carrot..... L. E. Smith Hardware, Gloucester	61	June
D-162	Danvers Half Long Carrot..... Fred Smith Hardware, Reading	57	June
D-270	Long Orange Carrot..... A. T. Knight, Hudson	56	July
D-155	EMPIRE SEED CO., Fredonia, N. Y. Chantenay Carrot..... L. M. Johnson, Reading	48	June-Dec.
D- 95	CHAS. C. HART SEED CO., Wethersfield, Conn. Danvers Half Long Carrot..... Spencer Hardware Co., Spencer	56	June
D-225	Danvers Half Long Carrot..... Ryder's, Inc., Hyannis	54	June
D-128	HAWKINS SEED CO., Reading, Vt. Improved Long Orange Carrot..... H. F. Davis Hardware, Merrimac	75	June
D-227	D. LANDRETH & CO., Bristol, Pa. Orange Danvers Carrot..... Hampshire Hardware Co., Northampton	48	June
D- 12	LEONARD SEED CO., Chicago, Ill. Danvers Carrot..... Norwood Hardware, Norwood	63	June
D-111	NORTHROP, KING & CO., Minneapolis, Minn. Chantenay Carrot..... A. H. Whidden & Sons, Peabody	59	June
D- 16	JEROME B. RICE SEED CO., Cambridge, N. Y. True Danvers Half Long Carrot..... Norwood Hardware, Norwood	42	June
D- 68	Chantenay Half Long Carrot..... Hall & Torrey Co., Rockland	44	June
D- 71	Coreless Carrot..... A. M. Brainerd, Rockland	47	June
D-178	Early French Short Horn Carrot..... Lockhart Hardware Co., Natick	60	June
D-252	Danvers Half Long Carrot..... A. L. Avery, Charlemont	58	June
D- 4	F. H. WOODRUFF & SONS, Milford, Conn. Hutchinson Carrot..... Frank, The Seedman, Springfield	42	April
D- 5	Chantenay Carrot..... Frank, The Seedman, Springfield	45	April

**CAULIFLOWER**

D-163	JOSEPH BRECK & SONS CORP., Boston, Mass. Erfurt Cauliflower..... Francis Bros., Reading	74	July
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## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
<b>CAULIFLOWER — Continued</b>			
D- 21	THOMAS W. EMERSON CO., Boston, Mass. Snowball Cauliflower..... Milne's Hardware, Walpole	59	July
D- 39	Snowball Cauliflower..... C. A. Smith, Millis	36	July
D-105	Paris Cauliflower .....	18	July
	Lynn Bird & Seed Store, Oxford St., Lynn		
D-143	JEROME B. RICE SEED CO., Cambridge, N. Y. Henderson's Early Snowball Cauliflower..... Gove Hardware Co., Amesbury	72	July
D-177	Henderson's Early Snowball Cauliflower..... Lockhart Hardware Co., Natick	69	July
<b>CELERY</b>			
D-170	D. M. FERRY SEED CO., Detroit, Mich. Soup or Cutting Celery .....	61	July
	George Taylor Hardware, Wakefield		
D-146	CHAS. C. HART SEED CO., Wethersfield, Conn. Giant Pascal Celery .....	61	July
	Gove Hardware Co., Amesbury		
D-183	LAKE SHORE SEED CO., Dunkirk, N. Y. White Plume Celery .....	51	July
	Cutler Grain Co., Framingham		
D- 17	JEROME B. RICE SEED CO., Cambridge, N. Y. Dwarf Golden Self-Blanching Celery..... Norwood Hardware, Norwood	25	July
<b>SWEET CORN</b>			
D- 55	JOSEPH BRECK & SONS CORP., Boston, Mass. Golden Bantam Sweet Corn .....	95	June
	Winer's Hardware Stores, 1350 Hancock St., Quincy		
D- 99	Golden Bantam Sweet Corn .....	82	June
	McKenna & Clarke Co., Lynn		
D-117	Mass. Grown Golden Bantam Sweet Corn .....	87	June
	J. R. Smith Hardware, Gloucester		
D-216	Golden Bantam Sweet Corn .....	93	June
	J. H. Davidson Estate, Hyannis		
D- 42	THOMAS W. EMERSON CO., Boston, Mass. Early Golden Sunrise Sweet Corn .....	82	June
	C. A. Smith, Millis		
D- 44	Golden Bantam Sweet Corn .....	71	June
	A. J. Cataldo & Sons, Franklin		
D-113	Mammoth First Crop Corn.....	85	June
	W. D. Adlington Hardware, Saugus		
D-149	Stowell's Evergreen Sweet Corn .....	76	June
	W. R. Hill Hardware, Andover		
D-228	Golden Sunrise Sweet Corn .....	73	June
	Ryther & Warren, Belchertown		
D- 73	CHAS. C. HART SEED CO., Wethersfield, Conn. Stowell's Evergreen Sweet Corn .....	79	June
	Chapin & Clark Co., West Springfield		
D- 74	Early Golden Bantam Sweet Corn .....	78	June
	Chapin & Clark Co., West Springfield		
D-259	Golden Bantam Sweet Corn .....	76	July
	Waite Hardware Co., Worcester		

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
SWEET CORN — Continued			
D-132	LEONARD SEED CO., Chicago, Ill. Bantam Evergreen Sweet Corn..... F. B. Keene Hardware, Amesbury	84	June
D-203	PAGE SEED CO., Greene, N. Y. Golden Bantam Sweet Corn..... J. H. Fairbanks Co., Central Square, Bridgewater	83	June
D- 35	JEROME B. RICE SEED CO., Cambridge, N. Y. Golden Bantam Sweet Corn..... W. A. Pitts, Medfield	41	June
D- 62	Golden Sunshine Sweet Corn..... Hall & Torrey Co., 265 Union St., Rockland	83	June
D- 63	Crosby's Sweet Corn..... Hall & Torrey Co., Rockland	46	June
D-213	Golden Bantam Sweet Corn..... Sherman Hardware & Furniture Co., No. Plymouth	90	June
D-234	Mammoth White Cory Sweet Corn..... Clifford Co., Lenox	64	June
D-250	Golden Sunshine Sweet Corn..... A. L. Avery & Son, Charlemont	79	June
D-251	Golden Sunshine Sweet Corn..... A. L. Avery & Son, Charlemont	55	July
D-267	Golden Bantam Sweet Corn..... Robinson Hardware Co., Hudson	87	July
D-231	ROSS BROS. CO., Worcester, Mass. Golden Bantam Corn..... W. H. Wood Co., South Hadley Falls	77	June
D-130	F. H. WOODRUFF & SONS, Milford, Conn. Whipple's Early Yellow Sweet Corn..... H. F. Davis Hardware, Merrimac	81	June
D-131	Golden Bantam Sweet Corn..... H. F. Davis Hardware, Merrimac	51	June
D-207	Golden Bantam Sweet Corn..... A. S. Barstow, Marshfield	92	June
D-261	S. D. WOODRUFF & SONS, Orange, Conn. Golden Bantam Sweet Corn..... Harding Street Grain Store, Worcester	89	July
CUCUMBER			
D-164	JOSEPH BRËCK & SONS CORP., Boston, Mass. Davis Perfect Cucumber..... Francis Bros., Reading	90	July
D-106	THOMAS W. EMERSON CO., Boston, Mass. Early Frame Cucumber..... Lynn Bird & Seed Store, Oxford St., Lynn	73	July
D-147	Arlington White Spine Cucumber..... W. R. Hill Hardware, Andover	94	July
D-195	Boston Pickling Cucumber..... A. C. Freeman, 15 South Ave., Whitman	96	July
D- 18	FERRY-MORSE SEED CO., Detroit, Mich. Improved Long Green Cucumber..... Norwood Hardware, Norwood	34	July
D-271	Boston Pickling Cucumber..... Lockhart Hardware Co., Hudson	93	July
D- 81	FREDONIA SEED CO., Fredonia, N. Y. Early White Spine Cucumber..... T. W. Haley, Monson	71	July

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
<b>CUCUMBER — Continued</b>			
D- 37	CHAS. C. HART SEED CO., Wethersfield, Conn. Improved White Spine Cucumber..... W. A. Fitts, Medfield	79	July
D- 94	Boston Cucumber..... Spencer Hardware Co., Spencer	95	July
D-182	LAKE SHORE SEED CO., Dunkirk, N. Y. Peerless White Spine Cucumber..... Cutler Grain Co., Framingham	52	July
D- 11	LEONARD SEED CO., Chicago, Ill. Early Cluster Cucumber..... Norwood Hardware, Norwood	97	July
D-109	Early Fortune Cucumber..... Standard Hardware, Peabody	95	July
D- 69	JEROME B. RICE SEED CO., Cambridge, N. Y. White Spine Cucumber..... A. M. Brainerd, 255 Union St., Rockland	92	July
D-217	White Spine Cucumber..... J. H. Davidson Estate, Dennis	19	July
D-141	ROSS BROS. CO., Worcester, Mass. Boston Pickling Cucumber..... Smith Grain Co., Amesbury	85	July
D-236	F. H. WOODRUFF & SONS, Milford, Conn. Improved White Spine Cucumber..... Platt & Goslee, Gt. Barrington	98	July
D- 96	S. D. WOODRUFF & SONS, Orange, Conn. Davis Perfect Cucumber..... Holyoke Farm Machinery Co., Holyoke	90	July
<b>ENDIVE</b>			
D-273	FERRY-MORSE SEED CO., Detroit, Mich. Large Green Curled Endive..... Lockhart Hardware Co., Hudson	79	Aug.
<b>LETTUCE</b>			
D- 49	CONTINENTAL NURSERIES, Franklin, Mass. Boston Market Lettuce..... A. J. Cataldo & Sons, Franklin	4	July
D-246	CROSMAN SEED CO., East Rochester, N. Y. Early Curled Simpson Lettuce..... George G. Henry, Ashfield	73	July
D- 22	THOMAS W. EMERSON CO., Boston, Mass. Early Curled Simpson Lettuce..... Milne's Hardware, Walpole	96	July
D-196	Hanson Lettuce..... A. C. Freeman, 15 South Ave., Whitman	76	July
D-158	EMPIRE SEED CO., Fredonia, N. Y. Green Icehead Lettuce..... L. M. Johnson, Reading	2	July-Dec.
D-210	FERRY-MORSE SEED CO., Detroit, Mich. Black Seeded Simpson Lettuce..... A. S. Barstow, Marshfield	84	July
D- 53	CHAS. C. HART SEED CO., Wethersfield, Conn. Simpson' Early Curled Lettuce..... John A. Geb, Franklin	97	July
D- 92	Iceberg Lettuce..... Spencer Hardware Co., Spencer	96	July

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
LETTUCE — Continued			
D-249	CHAS. C. HART SEED CO. — Continued Big Boston Head Lettuce..... A. W. Crafts, Ashfield	70	July
D-276	Prize Head Lettuce..... Vanderhoof Hardware Co., Concord	97	July
D-127	HAWKINS SEED CO., Reading, Vt. Improved Hanson Lettuce..... H. F. Davis Hardware, Merrimac	81	July
D-181	LAKE SHORE SEED CO., Dunkirk, N. Y. Big Boston Lettuce..... Cutler Grain Co., Framingham	63	July
D- 88	D. LANDRETH SEED CO., Bristol, Pa. Curled Simpson Lettuce..... P. A. Richard Hardware Co., Spencer	90	July
D-108	LEONARD SEED CO., Chicago, Ill. Big Boston Lettuce..... Standard Hardware Co., Peabody	77	July
D- 33	PAGE SEED CO., Greene, N. Y. Iceberg Lettuce..... Gilbert Hardware Co., Medfield	78	July
D-169	JEROME B. RICE SEED CO., Cambridge, N. Y. Black-Seeded Lettuce..... Taylor Hardware, Wakefield	89	July
MUSKMELON			
D-168	JOSEPH BRECK & SONS CORP., Boston, Mass. Millers Cream Muskmelon..... George Taylor Hardware, Wakefield	77	July
D- 54	CHAS. C. HART SEED CO., Wethersfield, Conn. Benders Surprise Muskmelon..... John A. Geb, Franklin	80	July
D-189	Benders Surprise Muskmelon..... Sawyer's Hardware, Framingham	83	July
D- 84	PAGE SEED CO., Greene, N. Y. Muskmelon..... Fairbanks-Curtis, Warren	66	July
D- 32	JEROME B. RICE SEED CO., Cambridge, N. Y. Rocky Ford Muskmelon..... H. A. Spear Co., Walpole	24	July
D-142	Tip-Top Muskmelon..... Gove Hardware Co., Amesbury	79	July
ONION			
D- 89	D. LANDRETH SEED CO., Bristol, Pa. Yellow Globe Danvers Onion..... P. A. Richard Hardware Co., Spencer	71	July
PARSLEY			
D- 45	CONTINENTAL NURSERIES, Franklin, Mass. Double Curled Parsley..... A. J. Cataldo & Sons, Franklin	63	July
D-154	EMPIRE SEED CO., Fredonia, N. Y. Hamburg or Turnip Rooted Parsley..... L. M. Johnson, Reading	21	July
D-188	CHAS. C. HART SEED CO., Wethersfield, Conn. Italian or Plain Leaf Parsley..... Sawyer's Hardware, Framingham	77	July

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
PARSLEY — Continued			
D-214	JEROME B. RICE SEED CO., Cambridge, N. Y. Moss Curled Parsley..... Sherman Hardware & Furniture Co., No. Plymouth	50	July
D-139	ROSS BROS., CO., Worcester, Mass. Plain Leaved Parsley..... Smith Grain Co., Amesbury	76	July
PARSNIP			
D-101	JOSEPH BRECK & SONS CORP., Boston, Mass. Long Smooth White Parsnip..... McKenna & Clarke Hardware Co., Lynn	54	July
D-245	CROSMAN SEED CO., East Rochester, N. Y. Improved Hollow Crown Parsnip..... George G. Henry, Ashfield	85	July
D-199	THOMAS W. EMERSON CO., Boston, Mass. Long Smooth White Parsnip..... A. C. Freeman, 15 South Ave., Whitman	49	July
D-211	FERRY-MORSE SEED CO., Detroit, Mich. Hollow Crown Parsnip..... Ralph W. Newdick Estate, Marshfield	68	July
D-272	Hollow Crown Parsnip..... Lockhart Hardware Co., Hudson	78	July
D- 76	FREDONIA SEED CO., Fredonia, N. Y. Hollow Crown Parsnip..... T. W. Haley, Monson	51	July
D- 93	CHAS. C. HART SEED CO., Wethersfield, Conn. Hollow Crown Parsnip..... Spencer Hardware Co., Spencer	50	July
D-187	Hollow Crown Parsnip..... Sawyers Hardware, Framingham	89	July
D-126	HAWKINS SEED CO., Reading, Vt. Improved Hollow Crown Parsnip..... H. F. Davis Hardware, Merrimac	58	July
PEAS			
D-254	BERKSHIRE COAL & GRAIN CO., North Adams, Mass. Little Gem Dwarf Peas..... Fred O. Bicknell, Charlemont	78	July
D- 56	JOSEPH BRECK & SONS CORP., Boston, Mass. Sutton's Excelsior Peas..... Winer's Hardware Stores, 1350 Hancock St., Quincy	87	July
D-118	Sutton's Excelsior Peas..... J. R. Smith Hardware, Gloucester	84	July
D-165	Tall Telephone Peas..... Francis Bros., Reading	83	July
D-184	Laxtonia Peas..... Sawyer's Hardware, Framingham	74	July
D-226	Sutton's Excelsior Peas..... Ryder's Inc., Hyannis	88	July
D- 20	THOMAS W. EMERSON CO., Boston, Mass. Nott's Excelsior Peas..... Milne's Hardware, Walpole	88	July
D- 27	Prosperity Peas..... H. A. Spear, Walpole	79	July
D- 40	Nott's Excelsior Peas..... C. A. Smith, Millis	84	July

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
PEAS — Continued			
D-151	THOMAS. W. EMERSON CO. — Continued Blue Bantam Peas..... W. R. Hill Hardware, Andover	93	July
D-220	Thomas Laxton Peas..... Henry T. Crocker, Brewster	72	July
D- 72	CHAS. C. HART SEED CO., Wethersfield, Conn. World's Record Peas..... Chapin & Clark Co., West Springfield	98	July
D-260	Telephone Peas..... Waite Hardware Co., Worcester	88	July
D- 10	LEONARD SEED CO., Chicago, Ill. Thomas Laxton Peas..... Norwood Hardware, Norwood	90	July
D-134	American Wonder Peas..... F. B. Keene Hardware, Amesbury	84	July
D-241	JEROME B. RICE SEED CO., Cambridge, N. Y. Pioneer Peas..... Newcomb Hardware Co., Conway	77	July
D-242	Tall Telephone Peas..... Newcomb Hardware Co., Conway	84	July
D-243	Tall Telephone Peas..... Newcomb Hardware Co., Conway	85	July
D-247	Nott's Excelsior Peas..... Geo. C. Henry, Ashfield	88	July
D-266	Sutton's Excelsior Peas..... Robinson Hardware Co., Hudson	85	July
D-230	ROSS BROS. CO., Worcester, Mass. Nott's Excelsior Peas..... W. H. Wood Co., South Hadley Falls	62	July
D-205	F. H. WOODRUFF & SONS, Milford, Conn. Sutton's Excelsior Peas..... A. S. Barstow, Marshfield	92	July
D-229	Champion of England Peas..... H. Durant, Belchertown	76	July
D-238	Improved Telephone Peas..... Platt & Goslee, Gt. Barrington	58	July
PEPPER			
D-100	JOSEPH BRECK & SONS CORP., Boston, Mass. Large Bell Pepper..... McKenna & Clarke Hardware Co., Lynn	0	July
D-161	LAKE SHORE SEED CO., Dunkirk, N. Y. Red Bell Pepper..... Fred Smith Hardware, Reading	28	July
D- 8	F. H. WOODRUFF & SONS, Milford, Conn. Bull Nose Pepper..... Frank, The Seedman, Springfield	84	April
D-190	Ruby King Pepper..... Boston Supply Co., Framingham	73	July
RADISH			
D- 60	JOSEPH BRECK & SONS CORP., Boston, Mass. Scarlet Globe Radish..... Winer's Hardware Stores, 1350 Hancock St., Quincy	92	July
D- 24	THOMAS W. EMERSON CO., Boston, Mass. Early Scarlet Turnip White Tip Radish..... Milne's Hardware, Walpole	48	July



## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
<b>RADISH — Continued</b>			
D-122	THOMAS W. EMERSON CO.— Continued Early Scarlet Turnip Radish..... L. E. Smith Hardware, Gloucester	70	July
D-150	Scarlet Globe Radish..... W. R. Hill Hardware, Andover	84	July
D-248	FREDONIA SEED CO., Fredonia, N. Y. French Breakfast Radish..... A. W. Crafts, Ashfield	63	July
D- 52	CHAS. C. HART SEED CO., Wethersfield, Conn. French Breakfast Radish..... John A. Geb, Franklin	63	July
D-135	LEONARD SEED CO., Chicago, Ill. French Breakfast Radish..... F. B. Keene Hardware, Amesbury	75	July
D-112	NORTHROP, KING & CO., Minneapolis, Minn. Early Scarlet Turnip White Tip Radish..... A. H. Whidden & Sons, Peabody	88	July
D-274	Early Scarlet Globe Radish..... Vanderhoof Hardware Co., Concord	96	July
D- 34	PAGE SEED COMPANY, Greene, N. Y. Radish..... Gilbert Hardware Co., Medfield	73	July
D-186	French Breakfast Radish..... Sawyer's Hardware, Framingham	62	July
D-171	JEROME B. RICE SEED CO., Cambridge, N. Y. Vick's Early Scarlet Globe Radish..... George Taylor Hardware, Wakefield	71	July
D- 85	S. D. WOODRUFF & SONS, Orange, Conn. French Breakfast Radish..... J. Hibbard, West Brookfield	59	July
D- 98	Scarlet Globe Radish..... Holyoke Farm Machinery Co., Holyoke	34	July
D-263	Scarlet Globe Radish..... Harding Street Grain Store, Worcester	72	July
<b>RUTABAGA</b>			
D-235	F. H. WOODRUFF & SONS, Milford, Conn. Long Island Improved Rutabaga..... Platt & Goslee, Gt. Barrington	96	July
<b>SPINACH</b>			
D-173	JOSEPH BRECK & SONS CORP., Boston, Mass. Round Thick Leaf Spinach..... Grace Hardware Co., Wakefield	58	July
D-148	THOMAS W. EMERSON CO., Boston, Mass. Round Thick Leaf Spinach..... W. R. Hill Hardware, Andover	75	July
D-197	Round Thick Leaf Spinach..... A. C. Freeman, 15 South Ave., Whitman	64	July
D-185	CHAS. C. HART SEED CO., Wethersfield, Conn. Giant Thick Leaf Spinach..... Sawyer's Hardware, Framingham	72	July
D- 29	PAGE SEED CO., Greene, N. Y. Bloomsdale Spinach..... H. A. Spear Co., Walpole	44	July
D-201	Giant Thick Leaf Spinach..... J. H. Fairbanks Co., Bridgewater	89	July

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
SPINACH — Continued			
D-233	F. H. WOODRUFF & SONS, Milford, Conn. Bloomsdale Long Standing Savoy Spinach..... Haskell-Broderick Co., Lenox	73	July
D-262	S. D. WOODRUFF & SONS, Orange, Conn. Bloomsdale Savoy Spinach..... Harding Street Grain Store, Worcester	57	July
SQUASH			
D-198	THOMAS W. EMERSON CO., Boston, Mass. Early Summer Squash..... A. C. Freeman, Whitman	92	July
D-200	PAGE SEED CO., Greene, N. Y. Blue Hubbard Squash, W13-6532..... J. H. Fairbanks Co., Bridgewater	95	July
D-265	ROSS BROS. CO., Worcester, Mass. Golden Hubbard Squash..... Ross Bros. Co., Worcester	100	July
D-192	F. H. WOODRUFF & SONS, Milford, Conn. Giant Early Summer Crookneck Squash..... Boston Supply Co., Framingham	92	July
SWISS CHARD			
D-275	CHAS. C. HART SEED CO., Wethersfield, Conn. Dark Green Swiss Chard..... Vanderhoof Hardware Co., Concord	78	July
D- 79	LAKE SHORE SEED CO., Dunkirk, N. Y. Swiss Chard..... T. Jacobs, Monson	73	July
TOMATO			
D-102	JOSEPH BRECK & SONS CORP., Boston, Mass. Stone Tomato..... McKenna & Clarke Hardware Co., Lynn	67	June
D-176	Dwarf Champion Tomato..... Grace Hardware Co., Wakefield	70	June
D- 47	CONTINENTAL NURSERIES, Franklin, Mass. Acme Tomato..... A. J. Cataldo & Sons, Franklin	84	June
D- 19	FERRY-MORSE SEED CO., Detroit, Mich. Earliana Tomato..... Norwood Hardware, Norwood	65	June
D-125	HAWKINS SEED CO., Reading, Vt. Marglobe Tomato..... H. F. Davis Hardware, Merrimac	83	June
D-160	LAKE SHORE SEED CO., Dunkirk, N. Y. Ponderosa Tomato..... Fred Smith Hardware, Reading	53	June
D- 67	JEROME B. RICE SEED CO., Cambridge, N. Y. Sparks Earliana Tomato..... Hall & Torrey, Rockland	12	June
D-174	Stone Tomato..... Grace Hardware Co., Wakefield	70	June
D-140	ROSS BROS. CO., Worcester, Mass. Dwarf Champion Tomato..... Smith Grain Co., Amesbury	84	June
D-264	John Baer Tomato..... Ross Bros. Co., Worcester	87	July

## 1932 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1932 Month of Test
<b>TOMATO — Continued</b>			
D- 6	F. H. WOODRUFF & SONS, Milford, Conn. Bonny Best Tomato..... Frank, The Seedman, Springfield	92	April
D- 7	Livingston's Beauty Tomato..... Frank, The Seedman, Springfield	78	April
<b>TURNIP</b>			
D-137	JOSEPH BRECK & SONS CORP., Boston, Mass. White Egg Turnip..... Smith Grain Co., Amesbury	67	July
D-172	Extra Early Purple Top Strap Leaf Turnip..... Grace Hardware Co., Wakefield	70	July
D-123	THOMAS W. EMERSON CO., Boston, Mass. Strap Leaf Turnip..... L. E. Smith Hardware, Gloucester	98	July
D-268	White Egg Turnip..... A. T. Knight, Hudson	81	July
D-269	Purple Top White Globe Turnip..... A. T. Knight, Hudson	90	July
D- 90	D. LANDRETH SEED CO., Bristol, Pa. White Globe Turnip..... P. A. Richard Hardware Co., Spencer	83	July
D- 30	PAGE SEED CO., Greene, N. Y. Purple Top Strap Leaf Turnip..... H. A. Spear, Walpole	73	July
D- 66	JEROME B. RICE SEED CO., Cambridge, N. Y. Purple Top Turnip..... Hall & Torrey Co., Rockland	37	July
D-253	Purple Top Strap Leaf Turnip..... A. L. Avery, Charlemont	81	July
D-208	ROSS BROS. CO., Worcester, Mass. Early Purple Top Flat Turnip..... A. S. Barstow, Marshfield	78	July
D-193	F. H. WOODRUFF & SONS, Milford, Conn. Breadstone or Budlong Turnip..... Boston Supply Co., Framingham	1	July

## Type and Variety Studies of Sweet Corn

Conducted in Conjunction with the Department of Vegetable Gardening  
Prof. Grant B. Snyder

The field trials of sweet corn for 1932 included 69 varieties from 29 sources, or 211 lots. The seed was purchased in all cases from the seed firm or grower. In conducting the trials every effort was made to maintain uniform cultural conditions and fair evaluation of plant and ear characters.

Detailed records were taken of each lot as to maturity, yield, and plant, ear and kernel characters. Sugar readings were also taken of each lot during the maturity period. These records are available to anyone interested but they will not be presented in this report except in those cases where the lot was variable to a degree sufficient to influence its commercial value for the name under which it was sold.

In general the sorts included were fairly true in type for the variety designated by the seedsman. In the older, standard varieties, very few variations were noted in the various strains of a given sort. There was, however, considerable variation in strains of the more recently introduced varieties in season of maturity and plant characters. The lots which showed decided variation in one or more factors are listed below.

Golden Gem, Farmers Seed Co.: 40 per cent of plants tall and late in maturity.

Golden Gem, S. D. Woodruff: lot was Spanish Gold and not Golden Gem.

Spanish Gold, F. H. Woodruff: lot variable in growth and maturity.

Spanish Gold, Alex. Forbes Seed Co.: 5 per cent of plants tall and late, off type.

Earliest Yellow, W. Schell Seed Co.: two distinct types in lot, one tall and late, the other short and early.

Early Yellow Sensation and Extra Early Yellow, F. H. Woodruff: practically identical in maturity and in plant, ear and kernel characters.

Extra Early Golden, Comstock, Ferre Co.: two distinct types in lot.

Early Surprise, Hart Seed Co.: 50 per cent of lot later and taller than typical for Early Surprise.

Early Crosby, Ross Seed Co.: 5 per cent of plants decidedly off type.

Early Mayflower, Ross Seed Co.: 5 per cent of plants dwarf with 8-rowed ears.

In certain varieties considerable variation in number of rows of kernels per ear was noted as the only variable factor. Especially was this true of Golden Bantam where many strains ran from 10 to 12 and even 14 rows.

## Laboratory and Field Germination Tests of Sweet Corn

Seed Laboratory, Depts. of Vegetable Gardening and Botany Cooperating

Laboratory and field germination tests were made from the seed of each sample of sweet corn used for variety studies. Lots of two hundred seed were used both in laboratory and in field, not only to arrive at final figures but to record the presence of seed-borne organisms on the seed as received and the seedlings under laboratory test, also their relative importance upon field sown seed and resultant crop. Dr. O. C. Boyd of the Department of Botany identified and cultured organisms from both laboratory and field sown seed. Records of this work are on file at the Seed Laboratory which plans to continue the study for two more years before drawing conclusions and publishing results.

## Laboratory and Field Germination Tests of Garden Peas

Seed Laboratory, Depts. of Vegetable Gardening and Botany Cooperating

The pea germination trials as conducted in 1931 were repeated this year for the purpose of making further observations on seed viability and seed-borne diseases, using the same series of seed samples. Although a second planting was not made in the field, in addition to the field germination test, for the purpose of taking yield records, the plants in the germination plot were allowed to grow to maturity in order that observations might be made on the occurrence of seed-borne diseases. One hundred and twelve lots of seed were used, with one hundred seeds in each sample.

While there is little to be added to or changed in the summary remarks for the 1931 report, yet it might well be stressed that the following factors appear to have a definite bearing upon the germinating properties of pea seeds in the laboratory and upon the stand and vigor of plants in the field.

1. Presence of entirely dead or non-viable seeds, due at least in part to immature seeds, severely injured or broken seeds, and failure of the intake pore to open for water absorption.
2. Weak, incomplete, or abnormal germination, resulting in either non-emergence in the field, or weak, unproductive plants, due primarily to low vitality or to injured seed coat, cotyledons or embryo.
3. Heavy contamination of seed by common molds, which are able not only to cause decay of cotyledons during germination, but also to infect the seedling in the field at the first node and at root injuries.
4. Seed contamination or infection by field disease organisms, each of which may cause one or more of the following conditions: Decay of seed before germination; death of seedling due to root or stem rot before or shortly after emergence; stunting and weakening of the plant throughout the season due to root infection, resulting in low or no yields; wilting and subsequent death of the plant any time after early blossom, due to vascular infection of root and stem, resulting in reduction of stand, vigor of plants, and yield.

It has been found advisable to discontinue field experiments because of soil conditions not adapted to satisfactory culture of this crop.

## Type and Variety Tests of Legumes

Conducted in Conjunction with the Department of Agronomy  
Prof. M. H. Cubbon

Plantings in twelve foot rows were made August 7, 1931, the entire area having previously received a broadcast application of nitrophoska. Growth was exceptionally good. Observations were made at three stages of growth during the 1932 season, results of these being shown below.

ALFALFA		
Laboratory Number	Name	Type Found
A-12	Grimm Alfalfa	Variegated Alfalfa
A-40	Minnesota Alfalfa	Variegated Alfalfa
A-54	Idaho-grown Grimm Alfalfa	Variegated Alfalfa
A-55	Alfalfa (Idaho)	Common Alfalfa
A-79	Alfalfa	Variegated Alfalfa
A-97	Grimm Alfalfa	Variegated Alfalfa
B-68	Alfalfa	Variegated Alfalfa
B-101	Alfalfa	Variegated Alfalfa
B-111	Alfalfa	Variegated Alfalfa
B-142	Alfalfa	Variegated Alfalfa
B-156	Northwestern Grimm Alfalfa	Variegated Alfalfa

## RED CLOVER

Laboratory Number	Name	Type Found
A-7	Pan-American French Red Clover	Medium Red Clover
A-13	Red Clover	Medium Red Clover
A-22	Red Clover	Mammoth Red Clover
A-26	Red Clover	Medium Red Clover
A-92	Red Clover	Medium Red Clover
A-99	Red Clover	Medium Red Clover
A-104	Clover	Medium Red Clover
A-112	Red Clover	Medium Red Clover
B-9	Medium Red Clover	Medium Red Clover
B-21	Red Clover	Medium Red Clover
B-48	Imported Red Clover	Medium Red Clover
B-51	Medium Red Clover	Medium Red Clover
B-67	Pan-American Imported Red Clover	Medium Red Clover
B-73	Medium Red Clover	Medium Red Clover
B-90	Red Clover	Medium Red Clover
B-112	Pan-American Red Clover	Medium Red Clover
B-124	Red Clover	Medium Red Clover
B-129	Medium Red Clover	Medium Red Clover
B-144	Red Clover	Mammoth Red Clover
B-153	Domestic Red Clover	Medium Red Clover
B-163	Red Clover	Mammoth Red Clover
B-167	Medium Red Clover (Super)	Medium Red Clover
B-177	Medium Red Clover	Medium Red Clover

## SWEET CLOVER

A-62	No description	White biennial Sweet Clover
B-7	White biennial sweet clover	White biennial Sweet Clover
B-143	White biennial sweet clover	White biennial Sweet Clover

These results are of interest because of the apparent tendency of the seed trade to supply the variegated types of alfalfa, which are best suited to Massachusetts conditions. Also, it should be remembered that Mammoth Red Clover matures somewhat later than Medium Red Clover, and probably gives a larger first cutting, but produces practically no second crop. There are evidently no samples of seed in the above lots that are willfully mislabeled.



MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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Control Series

Bulletin No. 68

August, 1933

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# Thirteenth Annual Report on Eradication of Pullorum Disease in Massachusetts

By the Poultry Disease Control Laboratory

The results of testing for pullorum disease during the season of 1932-33 are reported in this bulletin. The consequences of failure to observe certain fundamental disease eradication principles have been pointed out to flock owners, and emphasis given to the measures necessary for the establishment and maintenance of pullorum disease-free flocks.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.



# THIRTEENTH ANNUAL REPORT ON ERADICATION OF PULLORUM DISEASE IN MASSACHUSETTS

1932—33

By The Poultry Disease Control Laboratory<sup>1</sup>

## Introduction

The testing data for the 1932-33 season show a marked decrease in the volume of work. Service was rendered to 338 flock owners, for whom 301,000 samples were tested. These figures show a decrease of 124 flocks and 120,895 samples from the previous season. Thirty-six flock owners cancelled their applications before the close of the season.

Necropsy service was given to 40 poultrymen whose flocks contained doubtful reacting birds. This service is regarded as a very helpful diagnostic aid in determining the status of a flock. Unfortunately, some poultrymen do not appreciate this fact because they fail to submit the requested birds to the laboratory. In such cases the flock is classified in this report as infected.

The number of samples from fowl other than chickens was less than during the previous season. While such fowl may not appear to be very susceptible to pullorum disease, yet it is reported from time to time that various species are infected with this disease. In order to determine the possible role that fowl other than chickens play in the establishment and maintenance of pullorum disease-free flocks, all poultrymen who maintain such birds are asked to cooperate with this laboratory in having them tested.

As in past years, the percentage of reactors was less among males than females. A total of 274,097 females was tested which revealed 1,342 (0.49 per cent) reactors; and 26,617 males which showed 78 (0.29 per cent) reactors.

A summary of the service rendered during the past year follows:

Applications received.....	374
Applications cancelled.....	36
Flocks tested.....	338*
Tests made.....	301,000
Chickens:—	
Routine.....	300,065
Experimental.....	649
Fowl other than chickens:—	
Routine.....	56
Experimental.....	230
Owners receiving necropsy service.....	40
Necropsies of reacting birds.....	70

\*Includes three flocks of poultry other than chickens.

<sup>1</sup>Poultry Disease Control Laboratory Staff: — H. Van Roekel, Chief of Laboratory; K. L. Bullis and D. M. Yegian, Assistant Veterinary Pathologists; O. S. Flint, Assistant Research Professor; Miriam K. Clarke and Felicia Zimnoski, Laboratory Assistants.

Appreciation is extended to all who have aided in the work, particularly to Dr. J. B. Lentz, Head of the Department of Veterinary Science; the County Extension Services; the Department of Poultry Husbandry, Massachusetts State College; and the Massachusetts Department of Agriculture.

TABLE 1 — DISTRIBUTION OF TESTS AND REACTORS, BY COUNTIES AND BY BREEDS

Breed	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Suffolk	Worcester	Totals	Percent Positive Tests
Rhode Island Reds.....(Total tests (Positive tests	4,298 111	2,168 93	33,784 171	1,125 36	22,443 156	9,112 8	8,903 7	14,196 42	41,391 80	48,870 161	32,021 93	565 0	35,321 77	254,197 1,035	0.41
Barred Plymouth Rocks (Total tests (Positive tests	116 0	..... .....	1,861 5	..... .....	2,614 0	102 0	80 0	1,070 130	6,627 86	937 0	5,129 2	..... .....	1,689 30	20,225 253	1.25
White Plymouth Rocks. (Total tests (Positive tests	..... .....	..... .....	2,517 7	103 0	1,134 10	..... .....	..... .....	55 0	2,015 0	556 0	4,825 0	..... .....	528 0	11,733 17	0.14
White Leghorns.....(Total tests (Positive tests	..... .....	3,508 6	4,342 0	..... .....	827 0	..... .....	..... .....	173 0	..... .....	1,905 0	208 0	..... .....	506 0	11,469 6	0.05
White Wyandottes.....(Total tests (Positive tests	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	620 0	937 0	537 0	..... .....	..... .....	2,094 0	0.00
Australorps.....(Total tests (Positive tests	..... .....	..... .....	..... .....	..... .....	209 20	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	265 77	265 77	29.06
Rhode Island Whites.....(Total tests (Positive tests	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	209 20	9.57
Miscellaneous.....(Total tests (Positive tests	..... .....	..... .....	93 10	..... .....	..... .....	54 0	..... .....	18 0	236 0	..... .....	10 1	..... .....	111 1	522 12	2.30
Total Tests.....	4,414	5,676	42,597	1,228	27,227	9,268	8,983	15,512	50,889	53,205	42,730	565	38,420	300,714	
Positive Tests.....(Number (Per Cent	111 2.51	99 1.74	193 0.45	36 2.93	186 0.68	8 0.09	7 0.08	172 1.11	166 0.33	161 0.30	96 0.22	0 0.00	185 0.48	1,420	0.47

### Distribution of Tests and Reactors

In Table 1 is given the distribution of tests and reactors by counties and by breeds. Norfolk, Middlesex, and Plymouth Counties lead in the number of tests. Only two counties had an increase in tests over the previous season, while the remaining counties showed a decrease.

Among the different breeds tested, the Rhode Island Red, Barred and White Plymouth Rock, and White Leghorn represent the leading breeds. It is of interest to note that while the Rhode Island Red breed represents the bulk of the tests, the average percentage of positive tests is below that (0.47) for all breeds. This table also shows that pullorum disease-free stock may be obtained among all the leading breeds in this State.

The outstanding encouraging result is that the average percentage of positive tests has decreased from 0.90 of the previous season to 0.47. Whether this low percentage of positive tests can be maintained depends upon how carefully and conscientiously poultrymen observe measures necessary for establishing and maintaining pullorum disease-free flocks.

### Annual Testing versus Single and Intermittent Testing

As the testing work progresses from year to year, the fact becomes more and more evident that annual testing of flocks will retain more flocks in the negative column than single or intermittent testing. Table 2 shows that flocks tested for the first time revealed the highest percentage of positive tests among the four groups. The intermittent group, while small in number of flocks, also exceeded the two annual tested groups in percentage of positive tests. In the group that was tested for three or more consecutive years there are 219 flocks, representing 243,385 birds, which revealed 0.21 per cent reactors. It is hoped that the owners of these flocks will continue to follow the annual testing program. No one can appreciate the progress that has been made in testing without a close study of the reports for the last six years. In spite of the fact that less flocks were tested this year than in the previous year, the number of negative flocks has not decreased in proportion in the groups tested annually. The poultrymen who own negative flocks and practice annual testing realize more profit than a poultryman who adopts any haphazard system of testing. Stock from the latter should be regarded by the buyer as questionable concerning its pullorum disease status.

TABLE 2. ANNUAL TESTING VERSUS SINGLE AND INTERMITTENT TESTING

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Per Cent	100% Tested	Partially Tested	100% Tested	Partially Tested
Tested for the first time.....	56	17,088	17,854	541	3.03	15	20	8	13
Intermittent testing history.....	14	10,947	11,484	253	2.20	2	5	3	4
Tested for two consecutive years....	46	24,673	25,759	122	0.47	21	19	4	2
Tested for three or more consecutive years.....	219	243,385	245,617	504	0.21	107	87	16	9
Totals.....	335	296,093	300,714	1,420	0.47	145	131	31	28

### Non-Reacting and Positive Flocks Classified by Counties

Table 3 shows that 276 flocks were classified as non-reacting. This is approximately 82 per cent of the total flocks tested, while in the previous season 78 per cent of the tested flocks were non-reacting. In two counties (Suffolk and Hampden) all the tested flocks were classified as non-reacting. The remaining counties had decreases in the number of non-reacting flocks.

TABLE 3—NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
<b>Non-Reacting Flocks</b>						
Barnstable.....	2	2,726	.....	.....	2	2,726
Berkshire.....	1	3,636	1	129	2	3,765
Bristol.....	19	17,897	23	15,428	42	33,325
Essex.....	13	13,286	14	9,314	27	22,600
Franklin.....	6	7,523	5	905	11	8,428
Hampden.....	10	6,238	2	2,127	12	8,365
Hampshire.....	13	8,368	7	4,566	20	12,934
Middlesex.....	23	27,563	20	15,458	43	43,021
Norfolk.....	11	12,207	20	17,789	31	29,996
Plymouth.....	28	26,492	20	12,523	48	39,015
Suffolk.....	1	565	.....	.....	1	565
Worcester.....	18	18,919	19	14,415	37	33,334
<b>Totals.....</b>	<b>145</b>	<b>145,420</b>	<b>131</b>	<b>92,654</b>	<b>276</b>	<b>238,074</b>
<b>Positive Flocks</b>						
Barnstable.....	1	1,384	1	179	2	1,563
Berkshire.....	2	1,563	1	348	3	1,911
Bristol.....	8	5,067	6	4,131	14	9,198
Dukes.....	1	960	.....	.....	1	960
Essex.....	2	2,431	1	344	3	2,775
Franklin.....	1	599	.....	.....	1	599
Hampshire.....	1	345	4	1,755	5	2,100
Middlesex.....	8	5,796	2	1,850	10	7,646
Norfolk.....	3	22,738	2	440	5	23,178
Plymouth.....	2	1,796	3	1,310	5	3,106
Worcester.....	2	951	8	4,032	10	4,983
<b>Totals.....</b>	<b>31</b>	<b>43,630</b>	<b>28</b>	<b>14,389</b>	<b>59</b>	<b>58,019</b>

The number of positive flocks was 59, representing approximately 17 per cent of the total flocks tested. The total number of birds in these flocks was 58,019, or approximately 20 per cent of the total tested birds. The previous season 100 positive flocks were reported, or approximately 22 per cent of the total tested flocks. Barnstable, Berkshire, and Hampshire Counties have increases in positive flocks over the previous season.

While the percentage of positive flocks has been steadily decreasing, the results show that ample infection still exists without mentioning the untested flocks in this State. Considering this fact, one should appreciate that pullorum disease is more prevalent in Massachusetts than other diseases, such as tuberculosis, fowl cholera, fowl typhoid, and infectious laryngotracheitis. Some poultrymen are inclined to divert their eradication efforts from pullorum disease to other diseases, especially

infectious laryngotracheitis. The latter can be eradicated by measures recommended by the Department of Veterinary Science, Amherst, Mass. While such measures are in principle basic for the eradication of most infectious diseases, some poultrymen do not appreciate that for pullorum disease a diagnostic means is available that aids in the establishment and maintenance of flocks free of this disease. Massachusetts poultrymen at present are not in position to adopt a system of testing different from annual testing, because there are too many sources of infection in this State. In order to reduce the number of infected flocks and to prevent the spread of infection, every effective means should be retained in our eradication program, which includes, above all, annual testing.

The total number of partially tested flocks was 159, representing 107,043 birds, or approximately 36 per cent of the total birds tested.

TABLE 4—COMPARISON OF 1931-32 AND 1932-33 TESTING

County	Flocks	Birds	Tests	Positive Tests Per Cent	Non-Reacting Flocks
<b>1931-32 Season</b>					
Barnstable.....	6	5,285	5,285	0.00	6
Berkshire.....	5	4,889	4,889	0.49	4
Bristol.....	70	51,583	54,755	1.17	53
Essex.....	44	36,113	36,135	1.04	35
Franklin.....	24	15,369	16,106	0.75	17
Hampden.....	15	8,688	11,055	2.75	11
Hampshire.....	28	15,417	16,527	0.51	24
Middlesex.....	76	69,804	74,652	0.51	55
Norfolk.....	45	52,745	68,084	1.05	36
Plymouth.....	81	66,591	81,096	0.93	63
Suffolk.....	1	549	549	0.00	1
Worcester.....	60	50,158	51,728	0.74	50
Totals.....	455	377,191	420,861	0.90	355
<b>1932-33 Season</b>					
Barnstable.....	4	4,289	4,414	2.51	2
Berkshire.....	5	5,676	5,676	1.74	2
Bristol.....	56	42,523	42,597	0.45	42
Dukes.....	1	960	1,228	2.93	0
Essex.....	30	25,375	27,227	0.68	27
Franklin.....	12	9,027	9,268	0.09	11
Hampden.....	12	8,365	8,983	0.08	12
Hampshire.....	25	15,034	15,512	1.11	20
Middlesex.....	53	50,667	50,889	0.33	43
Norfolk.....	36	53,174	53,205	0.30	31
Plymouth.....	53	42,121	42,730	0.22	48
Suffolk.....	1	565	565	0.00	1
Worcester.....	47	38,317	38,420	0.48	37
Totals.....	335	296,093	300,714	0.47	276

#### Comparison of the Past Two Testing Seasons

In comparing the past two testing seasons, one is greatly impressed by the decrease in tested flocks, birds, tests, and non-reacting flocks. Table 4 shows that Berkshire, Dukes, and Suffolk Counties had increases in tested birds and

tests, and Norfolk County had an increase in tested birds only. Plymouth County shows approximately a 50 per cent decrease in the number of tests. The remaining counties show decreases in tested flocks, birds, and tests. This is true also for non-reacting flocks with one exception: namely, that Hampden County shows an increase.

While the decreases in some counties were slight, in other counties they were more marked. Such circumstances may lead to a situation where some counties may not be able to meet the demand for pullorum disease-free stock, due to a lack of disease-free flocks in the county.

The fact that four counties show an increase in percentage of positive tests and the remaining counties a decrease demonstrates that persistent testing is the only effective means of establishing and maintaining disease-free flocks. The average percentage (0.47) of positive tests is the lowest attained in the testing history. Whether such a low percentage can be maintained depends largely upon the economic condition and attitude of the poultrymen.

### Suggestions

Since the most outstanding feature of the season is the decrease in volume of testing, it is essential that everyone concerned with pullorum disease eradication revive interest in establishing and maintaining pullorum disease-free flocks. It should be recognized that economic conditions have had a disappointing influence upon the testing work; but economic conditions are not responsible for all of the decrease in testing. Some flock owners entertain the idea that annual testing is not necessary to maintain a disease-free flock. It is accepted that the agglutination test is not a disease preventive but a diagnostic means which is used to determine the disease standing of a flock. This test is timed to detect infected individuals in the flock early enough so that economic losses and disappointment may be avoided during the hatching season. The flock owner who adopts the intermittent system of testing may sooner or later find himself in trouble. This has been observed frequently during the testing history of this State; and in some of these cases the livelihood of the poultryman has suffered because of disease troubles which could have been avoided if annual testing had been practiced. Assurance of disease-free flocks is made possible by annual testing and strict observance of eradication measures.

Frequently poultrymen report that chicks can be purchased more cheaply out of the State than in Massachusetts. This may be true when one compares only quoted prices, but not the quality of the stock. Pullorum diseased chicks submitted to our diagnostic laboratory can usually be traced to out-of-state flocks or to untested flocks in this State. Poultrymen who buy new stock are advised to buy as near home as possible, so that disease hazards may be reduced to a minimum. They should obtain the latest testing information concerning the source before the purchase is made. Such information may be obtained from the local county agent or from testing officials in other States.

While Massachusetts has made great progress in pullorum disease eradication, there is still much to be accomplished. It is hoped that the trend to omit testing, which was evident this past year, will be only temporary. One who is vitally interested in the pullorum disease standing of Massachusetts flocks for the future will agree that the following measures should be observed by flock owners at all times in order to progress in the right direction:—

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.
4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.
5. The poultry houses, runs, and equipment should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.
6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are re-admitted into the flock.
7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks. Consult your county agent regarding additions or replacements in your flock.
8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.
9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to animals such as crows, sparrows, and skunks that may carry or spread the infection.
10. Poultrymen should not custom hatch for untested or infected flocks.
11. Owners of pullorum disease-free flocks should not have hatching done where infected eggs or stock may be found.
12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

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MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 69

NOVEMBER, 1933

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Inspection of Commercial  
Fertilizers

By H. D. Haskins

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This is the sixtieth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920.

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Massachusetts State College  
Amherst, Mass.



# INSPECTION OF COMMERCIAL FERTILIZERS FOR THE SEASON OF 1933

By H. D. Haskins, Official Chemist <sup>1</sup>

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## MANUFACTURERS AND BRANDS

Registrations have been perfected in Massachusetts during 1933 by 106 firms, covering 495 brands of mixed fertilizer and unmixed fertilizing materials. The nature of these products is shown by the following classification:

Complete fertilizers . . . . .	301
Ammoniated superphosphates . . . . .	5
Superphosphates with potash . . . . .	2
Dry ground fish, tankage and ground bone . . . . .	53
Fertilizer simples, including organic nitrogen compounds . . . . .	83
Tobacco stems . . . . .	2
Pulverized manures . . . . .	31
Cotton hull ashes and wood ashes . . . . .	3
Peat products . . . . .	7
Stone meal . . . . .	2
Nitrate of potash . . . . .	4
Garbage tankage . . . . .	2
 Total . . . . .	 495

Representative samples of the following brands were not drawn as they were not found on display by our sampling agents.

<sup>1</sup> Assisted by H. Robert DeRose, Albert F. Spelman, J. W. Kuzmeski, F. Civile Pray, Chemists; James T. Howard C. L. Whiting, A. G. Brigham, G. E. Taylor, Sampling Agents; Harry L. Allen, Laboratory Assistant; Cora B. Grover Clerk.

## Brands of Fertilizer Registered but Not Sampled.

<b>Acme Guano Co.</b> Acme 4-8-4	<b>Eastern States Farmers' Exchange</b> Eastern States 5-5-15 Supplement Tobacco Eastern States 6-3-6 Tobacco	<b>Olds &amp; Whipple, Inc.</b> Special Mixture (J. L. Day) Cotton Hull Ashes
<b>American Agricultural Chemical Co.</b> Agrico for Onions 3-10-6	<b>Thomas W. Emerson Co.</b> Steamed Bone Meal	<b>Pacific Manure and Fertilizer Co.</b> Groz-It Brand Pulverized Sheep Manure
<b>Apothecaries Hall Co.</b> Liberty Potato & Vegetable 2-8-10 Liberty 10-16-14 Bone Meal Cottonseed Meal (Perkins Oil Co.)	<b>H. L. Frost &amp; Co.</b> Frost's Shade Tree Special 10-6-6	<b>Springfield Rendering Co.</b> "80% C. S. Meal 20% Sulphate of Ammonia" Lawn Dressing
<b>Armour Fertilizer Works</b> Armours Big Crop Fertilizers 2-8-10 Armours Lawn & Garden 5-8-6 Armours Special Turf Fertilizer 10-8-6 Special Mixture 10-7-0"	<b>International Agricultural Corp.</b> International Castor Pomace International Cotton Seed Meal 41%	<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b> Standard United States 4 x 8 x 7 Standard United States 4 x 10 x 5 Standard United States 5 x 10 x 5 Standard United States 7 x 6 x 5
<b>Barrett Co.</b> Sulphate of Ammonia	<b>M. F. Lansill</b> Lan-Fer Special 8-6-2	<b>Sutton &amp; Sons, Ltd.</b> Sutton's Simplex Fertilizer
<b>Berkshire Chemical Co.</b> Berkshire Cotton Hull Ash Berkshire Sulphate of Ammonia Berkshire Ground Tankage	<b>L. B. Lovitt &amp; Co.</b> "Lovit Brand" 43% Cottonseed Meal	<b>Virginia-Carolina Chemical Corp.</b> V-C National Brand 4-8-10
	<b>Lowell Fertilizer Co.</b> Lowell 7-3-7 High Analysis Tobacco	
	<b>Miller Fertilizer Co.</b> Miller's Superphosphate 16%	

## Drawing of Samples.

Between April 1 and June 15, four sampling agents working independently made a thorough canvass of the state by means of automobile. Counties assigned to each agent were as follows: James T. Howard, Hampshire, Hampden, Franklin and Berkshire; A. G. Brigham, Worcester; G. E. Taylor, Norfolk, Bristol, Plymouth, Barnstable and Dukes; C. L. Whiting, Essex, Middlesex and Suffolk.

Following are the sampling statistics for the year: 18,276 sacks were sampled, representing 7,285 tons of fertilizer. One ton was sampled to every seven and one-half tons sold in the state. One hundred and eighty-nine towns were visited: 1,686 samples, representing 495 distinct brands, were drawn from stock in the possession of 580 agents or owners; 230 other agents were called upon but no samples were drawn as the agency had been discontinued, stocks all sold out, or already sampled in sufficient amounts at other agencies in the territory.

## COMPARATIVE COST OF FERTILIZER CHEMICALS AND UNMIXED FERTILIZER PRODUCTS.

The following table gives average quotations taken from the Oil, Paint and Drug Reporter and Chemical Markets.

### Wholesale Quotations on Chemicals and Unmixed Materials.

NATURE OF MATERIAL.	AVERAGE PRICE PER TON FOR SIX MONTHS PRECEDING MARCH 1.		Price Per Ton Sept. 25, 1933.	Difference Between Sept. 25 Price and Six Months' Average; Sept. 1, 1932— Mar. 1, 1933.
	1932.	1933.		
Ammonium sulfate (20.5% N), 200 lb. bags, northern ports	\$25.41	\$22.58	\$24.00	+\$1.42
Nitrate of soda (15.5% N), bags, natural or synthetic, ex vessel	36.58	25.68	25.20	-.48
Nitrate of lime (15% N), bags, northern ports, ex vessel	36.24	26.33	25.00	-1.33
Nitrate of potash (13% N, 44% K <sub>2</sub> O), bags, c.i.f. ports	56.79	56.65	53.50	-3.15
Urea (46% N), car lots, bags, ex vessel	82.60	82.60	82.60	none
Dried blood (12.34% N), ground, bulk, New York	27.13	24.66	40.00	+15.34
Hoof meal (14.15% N), f.o.b. Chicago	22.95	15.12	23.83	+8.71
Animal tankage (8.23% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), ground, bulk, New York	16.81	17.30	26.00	+8.70
Dry ground fish (9.02% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), bags, Baltimore	43.06	30.50	38.00	+7.50
Cottonseed meal (5.76% N), bags, at mill	14.71	15.24	19.00	+3.76
Castor pomace (4.52% N), bags, car lots, f.o.b. works	-	12.45	16.50	+4.05
Ground bone (2.47% N, 22.88% P <sub>2</sub> O <sub>5</sub> ), bags, f.o.b. Chicago	21.00	17.40	24.00	+6.60
Superphosphate (16% avail. P <sub>2</sub> O <sub>5</sub> ), bulk, f.o.b. Baltimore	8.00	7.29	7.50	+21
Muriate of potash (50.54% K <sub>2</sub> O), bags	37.15	37.15	37.15	none
High grade sulfate of potash (48.65% K <sub>2</sub> O), bags	48.25	47.50	42.15	-5.35
Potash-magnesia sulfate (25.94% K <sub>2</sub> O), bags	27.80	27.80	25.00	-2.80
Cotton hull ashes (25% K <sub>2</sub> O), bulk, delivered, car lots	-	33.75	33.75	none

The mineral forms of nitrogen have registered a decline in price during 1933 as compared with the previous year, and up to October 1 the only partial recovery noted in this class of ammoniates was confined to ammonium sulfate which had advanced \$1.42 over the six months' average ending March 1. The nitrate forms have continued to decline as will be noted from the above tabulated data; on October 30, however, a slight increase in price was noted over the low prices previously recorded for this form of nitrogen salt.

The cost of most of the organic ammoniates for the six months ending March 1, 1933, was less than for the corresponding period in 1932. The price recovery of most of these products, however, has been quite marked during the early fall (September 25), ranging from 0 in case of synthetic urea to \$8.70 in case of animal tankage and hoof meal. During the month of October, however, a decline in price is noted for most of these products as compared with quotations listed as of September 25; these price declines vary with the different commodities; for blood it was \$1.60 per ton, for hoof meal \$3.32, for animal tankage 50 cents, for cottonseed meal \$2.50, while for fish and castor pomace no change was noted. Synthetic urea was advanced in price during October to \$90 per ton, registering an advance of \$7.40 over September 25.

Superphosphate showed an advance of 21 cents per ton over the six months' average and during October advanced another 50 cents to \$8 per ton, making an actual gain over the six months' average of 71 cents.

Judging from this review of the market, any increase in the cost of mixed fertilizers for 1934 should be due largely to the normal increase in cost of manufacture through the adoption of the N. R. A. code.

The following fertilizer trade values are based on average wholesale quotations of fertilizer chemicals and unmixed materials, as taken from trade journals for six months ending March 1, 1933, to which 20 per cent has been added for overhead. When appropriate, an additional allowance has also been made for bags, labor and transportation.

### Fertilizer Trade Values.

FORM OF PLANT FOOD.	Value per Pound.	Unit Value.
Nitrogen.		
In ammonia salts . . . . .	\$0.065	\$1.30
In nitrates . . . . .	.10	2.00
Organic nitrogen in fish . . . . .	.20	4.00
Organic nitrogen in blood, meat and hoof meal . . . . .	.13	2.60
Organic nitrogen in fine <sup>1</sup> bone and tankage . . . . .	.135	2.70
Organic nitrogen in coarse <sup>1</sup> bone and tankage and in pulverized manures . . . . .	.09	1.80
Organic nitrogen in mixed fertilizers . . . . .	.14	2.80
Organic nitrogen in cottonseed meal, castor pomace, linseed meal, etc. . . . .	.17	3.40
Organic nitrogen in urea and calurea . . . . .	.1075	2.15
Organic nitrogen in cyanamid . . . . .	.06	1.20
Phosphoric Acid.		
Soluble in water and neutral citrate of ammonia (available) . . . . .	.045	.90
In fine <sup>1</sup> bone and tankage and fish . . . . .	.045	.90
In coarse <sup>1</sup> bone and tankage . . . . .	.04	.80
In pulverized manures, seed residues, and ashes . . . . .	.04	.80
Insoluble in mixed fertilizers . . . . .	.02	.40
Potash.		
As sulfate . . . . .	.059	1.18
As muriate . . . . .	.044	.88
As nitrate . . . . .	.04	.80
As carbonate . . . . .	.075	1.50
In pulverized manures, seed residues, and the water insoluble portion in ashes . . . . .	.04	.80

<sup>1</sup> Fine bone and tankage refers to particles which, as sampled, will pass through a sieve with circular openings 1-50 of an inch in diameter. Coarse bone and tankage refers to that portion which will not pass through the sieve.

**FERTILIZER TONNAGE.****Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts.**

	July 1, 1930, to July 1, 1931.	July 1, 1931, to July 1, 1932.	July 1, 1932, to July 1, 1933.
Mixed fertilizers	43,463	39,689	37,076
Fertilizer chemicals and materials unmixed	19,174	20,325	16,451
Pulverized natural manures . . . . .	2,426	1,939	1,443
Totals . . . . .	65,063	61,953	54,970

There were 6,983 tons less fertilizer sold in the state in 1933 than during the previous year. The tonnage of mixed fertilizers was 2,613 less, and that of the fertilizer chemicals and unmixed materials was 3,874 less than for 1932. Pulverized manures showed a decrease of 496 tons.

Of the total tonnage sold, 67.45 per cent was mixed fertilizer, 29.93 per cent was unmixed materials, and 2.62 per cent was dried and pulverized natural manures.

**Plant Food Tonnage.**

	Nitrogen.		Phosphoric Acid.		Potash.	
	1932.	1933.	1932.	1933.	1932.	1933.
Mixed fertilizers	1,957	1,845	3,386	3,078	2,725	2,408
Fertilizer chemicals and materials unmixed	1,350	1,187	1,476	1,343	534	400
Pulverized natural manures . . . . .	40	31	27	21	53	40
Totals . . . . .	3,347	3,063	4,889	4,442	3,312	2,848

There were 1,193 tons less of plant food sold in the state than during 1932, of which 283 tons were nitrogen, 446 tons available phosphoric acid, and 464 tons potash.

There were 10,355 tons of plant food sold, of which 29.59 per cent was nitrogen, 42.91 per cent available phosphoric acid, and 27.50 per cent potash. Mixed fertilizers furnished 70.80 per cent of the plant food, chemicals and unmixed materials 28.31 per cent, and pulverized manures 0.89 per cent.

The three plant food elements were furnished in the following proportions by the mixed fertilizers and the unmixed materials including the pulverized manures: nitrogen, 60.22 per cent from mixed and 39.78 from unmixed; phosphoric acid, 69.28 per cent from mixed and 30.72 from unmixed; potash, 84.55 per cent from mixed and 15.45 per cent from unmixed.

The following table presents tonnage figures for the period from July 1, 1932, to July 1, 1933, for both mixed fertilizers and unmixed fertilizer materials. The fertilizer grades are expressed in round numbers and in the order of nitrogen, available phosphoric acid and potash, which represent the plant food guarantee of each fertilizer grade.

## (a) Tonnage of Mixed Fertilizers.

## COMPLETE FERTILIZERS.

*14 Per Cent or More of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash).*

Grade.	Tonnage.	Brands.	Grade.	Tonnage.	Brands.
5-8-7	10,817	35	7-12-10	110	—
4-8-4	8,287	32	2-12-4	101	—
4-8-7	2,858	24	7-13-11	98	—
4-8-10	1,557	15	4-10-6	94	—
7-6-6	1,361	13	2-8-10	93	—
3-10-4	1,162	10	5-5-15	92	—
6-3-6	1,040	11	15-30-15	90	—
5-8-10	602	6	5-5-5	87	—
4-12-4	577	—	5-8-6	84	—
4-8-8	560	—	6-6-5	81	—
4-10-5	542	—	4-4-15	79	—
5-3-6	405	—	8-6-2	76	—
8-16-14	395	8	10-16-20	74	—
2-10-2	383	9	6-7-4	73	—
5-10-5	322	—	10-6-4	60	—
5-8-12	293	—	3-7-6	55	—
6-3-7	285	—	6-15-9	55	—
3-8-4	285	—	7-5-2	52	—
8-16-16	275	—	10-20-20	45	—
4-10-4	272	—	6-11-10	44	—
5-10-4	269	—	9-6-6	39	—
6-3-8	254	—	15-20-15	39	—
5-6-4	223	—	8-24-8	29	—
6-8-6	220	—	5-10-10	28	—
3-10-6	193	—	5-2-13	24	—
4-8-5	164	—	7-8-6	22	—
4-6-10	145	—	5-8-5	18	—
8-5-8	134	—	8-6-5	18	—
5-9-9	123	—	6-4-5	18	—
			Miscellaneous	216	34
			Totals	35,997	285

*Less than 14 Per Cent of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash).*

5-3-5	786	8	4-3-5	71	—
4-2-2	115	—	Miscellaneous	42	8
			Totals	1,014	18

AMMONIATED SUPERPHOSPHATE, SUPERPHOSPHATE WITH POTASH, AND  
NITROGEN WITH POTASH.

2-0-8	29	—	0-20-20	6	—
0-14-6	17	—	4-10-0	3	—
10-7-0	10	—	Totals	65	5

Of the 35,997 tons of complete fertilizer guaranteed to contain 14 per cent or more of available plant food, 75.2 per cent was furnished by 7 grades and 140 brands. Double- and multiple-strength grades totalled 969 tons and 20 brands, which was 35 tons less than during the previous year.

Of the mixed fertilizer sold, 97.1 per cent contained 14 per cent or over of available plant food, compared with 96.75 per cent in 1932.

There were 275 tons less of low-analysis (less than 14 per cent available plant food) complete fertilizers sold than in 1932. The 5-3-5 grade, comprising 8 brands, furnished about 78 per cent of the tonnage of these low-analysis goods. About 96 per cent was furnished by 3 grades, comprising 10 brands.

## (b) Tonnage of Unmixed Fertilizing Materials.

MATERIAL.	Tonnage.	Brands.	MATERIAL.	Tonnage.	Brands.
Superphosphate . . .	4,205	17	Nitrate of potash . . .	107	-
Nitrate of soda . . .	2,597	8	Sulfate of potash . . .	84	-
Ground bone . . .	2,076	26	Calcium nitrate . . .	70	-
Cottonseed meal . . .	1,957	11	Linseed meal . . .	52	-
Pulverized animal manures	1,443	32	Precipitated bone . . .	32	-
Ammonium sulfate . . .	1,179	14	Synthetic urea . . .	27	-
Cyanamid . . .	785	-	Ammo-Phos . . .	26	-
Muriate of potash . . .	620	6	Wood ashes . . .	25	-
Animal tankage . . .	566	14	Double superphosphate	24	-
Milorganite . . .	418	-	Dried blood . . .	24	-
Peat . . .	421	8	Peruvian guano . . .	22	-
Castor pomace . . .	295	7	Cotton hull ashes . . .	17	-
Dry ground fish . . .	258	10	Cal Nitro . . .	17	-
Stone Meal . . .	216	-	Phosphate of lime . . .	16	-
Basic slag phosphate . . .	151	-	Miscellaneous . . .	14	6
Ground tobacco stems . .	150	-	Totals . . .	17,894	193

The tonnage of unmixed materials was distributed as follows: nitrogen products, 39.26 per cent; phosphoric acid products, 24.75 per cent; potash products, 4.03 per cent; tankage, fish, bone, tobacco stems, wood ashes and nitrate of potash, 20.12 per cent; and miscellaneous, 11.85 per cent.

Ten of the most popular grades are listed in the following table in comparison with a similar list for 1932.

1932.		1933.	
GRADE.	Tonnage.	GRADE.	Tonnage.
5-8-7 . . . . .	9,806	5-8-7 . . . . .	10,817
4-8-4 . . . . .	7,337	4-8-4 . . . . .	8,287
4-8-7 . . . . .	4,475	4-8-7 . . . . .	2,858
4-8-10 . . . . .	1,791	4-8-10 . . . . .	1,557
3-10-4 . . . . .	1,428	7-6-6 . . . . .	1,361
7-6-6 . . . . .	1,286	3-10-4 . . . . .	1,162
4-10-5 . . . . .	1,271	6-3-6 . . . . .	1,040
3-8-4 . . . . .	972	5-3-5 . . . . .	786
4-12-4 . . . . .	908	5-8-10 . . . . .	602
5-3-5 . . . . .	862	4-12-4 . . . . .	577

During both 1932 and 1933 the four fertilizer grades bought by the Massachusetts farmers in the largest tonnage were 5-8-7, 4-8-4, 4-8-7, and 4-8-10. The 3-10-4 and 7-6-6 grades, which occupied the fifth and sixth places respectively in 1932, changed places this year. The 4-10-5 grade, which had the seventh largest tonnage in 1932, dropped to the eleventh place in 1933, while the seventh place was taken by the 6-3-6 grade. The 3-8-4 grade, which had the eighth largest tonnage in 1932, occupied eighteenth place this season with a decrease of 687 tons sold; and 5-3-5 occupied eighth place. The 4-12-4 grade with ninth largest tonnage in 1932 dropped to tenth place this year, with a decrease of 331 tons. The 5-8-10 grade, which was in the eleventh place in 1932, took the ninth place this season, but with a decrease of 189 tons over the previous year.

### "New England Standard Nine" Grades.

This subject has taken on added interest with the adoption of Article VII, Section 1, of the National Recovery Act Code of Fair Competition of the Fertilizer Industry, in force November 10, 1933. This provides that the number of grades of mixed fertilizer may be materially reduced in any state by the selection, through cooperation of the fertilizer manufacturer with agronomists and Federal and state agricultural officials, of a list of grades suitable to meet the agricultural needs of that particular zone or state. The following table shows how the actual tonnage sold in 1933 corresponded with the nine grades selected by New England agronomists in 1931 to care for the average fertilizer needs of New England.

NEW ENGLAND STANDARD NINE GRADES.	Tonnage.	Additional Tonnage from Grades Varying but 1% in One or More Plant Foods.	Total.
5-8-7 . . . . .	10,817	3,722	14,539
4-8-4 . . . . .	8,378 <sup>a</sup>	486	8,864
4-8-10 . . . . .	1,557	123	1,680
7-6-6 . . . . .	1,361	120	1,481
6-3-6 . . . . .	1,041 <sup>b</sup>	1,494	2,535
3-10-4 . . . . .	1,162	814	1,976
2-12-4 . . . . .	101	-	101
5-8-10 . . . . .	676 <sup>c</sup>	-	676
2-8-10 . . . . .	98 <sup>d</sup>	-	98
	25,191	6,759	31,950

<sup>a</sup> Including 89.62 tons of 15-30-15 and 1.5 tons of 8-16-8.

<sup>b</sup> Including 1 ton of 10-5-10.

<sup>c</sup> Including 74 tons of 10-16-20.

<sup>d</sup> Including 5 tons of 4-16-20.

Of the total tonnage of mixed fertilizers sold, 67.94 per cent was from grades recommended in 1931 by New England agronomists to meet New England conditions, and an additional 18.23 per cent was from grades varying but one per cent in one or more plant food elements from the grades thus recommended. Of the ten grades, including the multiple strength mixtures, that have the highest tonnage (29,337 tons), all but three were among the New England Standard Nine. These seven grades showed a total tonnage of 24,992.

Over 14 per cent of the total tonnage of mixed fertilizers was from five grades not included in the New England Standard Nine. They are 4-8-7, third largest tonnage sold; 5-3-5, eighth largest; 4-12-4, tenth largest; 4-8-8, eleventh largest; and 4-10-5, the twelfth largest.



## MIXED FERTILIZERS.

## Deficiency Statistics for Mixed Fertilizers.

MANUFACTURER.	NUMBER OF BRANDS.		NUMBER OF TESTS OR DETERMINATIONS.				
	Analyzed.	Approximately Equal to Guarantee in Commercial Valuation.	Totals. (a)	Not Exceeding $\frac{1}{4}$ Per Cent Below Guarantee.	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee.	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee.	More than $\frac{3}{4}$ Per Cent Below Guarantee.
Acme Guano Co. . . . .	1	1	3	1	0	0	0
American Agricultural Chemical Co. . . . .	48	48	144	10	5	1	0
American Soda Products Co. . . . .	1	1	3	0	0	0	0
Apothecaries Hall Co. . . . .	11	11	33	1	0	0	0
Armour Fertilizer Works . . . . .	13	13	39	3	1	1	0
Barrie Laboratories, Inc. . . . .	1	1	3	0	0	0	0
F. A. Bartlett Tree Expert Co., Inc. . . . .	1	1	3	0	0	0	0
Berkshire Chemical Co. . . . .	12	12	36	0	0	0	0
Joseph Breck & Sons Corp. . . . .	1	1	3	0	1	0	0
Clay & Son, Ltd. . . . .	1	1	3	0	0	0	0
Cobwell Reduction Co., Inc. . . . .	1	1	3	0	0	0	0
Collins Seed Service Co. . . . .	3	2	9	0	0	2	1
Consolidated Rendering Co. . . . .	5	5	15	1	0	1	0
Davey Tree Expert Co. . . . .	1	1	3	0	1	0	0
Eastern States Farmers' Exchange . . . . .	18	18	52	2	2	0	1
Thomas W. Emerson Co. . . . .	1	1	3	0	0	0	1
Essex Fertilizer Co. . . . .	8	8	24	4	0	0	0
L. T. Frisbie Co. . . . .	1	1	3	0	0	0	0
H. L. Frost & Co. . . . .	1	1	3	0	0	0	1
Goulard & Olen, Inc. . . . .	1	1	3	0	0	0	0
T. J. Grey Co. . . . .	1	1	3	0	0	0	0
Thomas Hersom & Co. . . . .	2	2	6	0	0	0	0
International Agricultural Corp. . . . .	11	11	33	5	1	0	0
Little-Tree Farms . . . . .	1	1	3	0	0	0	0
Lowell Fertilizer Co. . . . .	11	11	33	1	1	0	0
Maine Farmers Exchange, Inc. . . . .	2	2	6	1	0	0	0
Miller Fertilizer Co. . . . .	2	2	6	1	0	0	0
New England Fertilizer Co. . . . .	8	8	24	3	1	0	0
Nitrate Agencies Co. . . . .	1	1	3	0	0	0	0
Old Deerfield Fertilizer Co., Inc. . . . .	16	16	48	2	0	0	0
Olds & Whipple, Inc. . . . .	12	12	35	1	0	0	0
Pawtucket Rendering Co. . . . .	5	5	15	1	0	0	0
Pedigreed Seed Co., Inc. . . . .	1	1	3	0	0	1	0
F. G. Phillips Co. . . . .	1	1	3	0	0	0	0
Piedmont-Mt. Airy Guano Co., Inc. . . . .	6	6	18	0	1	0	1
Plantabbs Corp. . . . .	1	1	3	0	0	0	0
Rogers & Hubbard Co. . . . .	22	21	66	3	2	0	3
F. S. Royster Guano Co. . . . .	4	4	12	1	1	0	0
Salem Chemical & Supply Co. . . . .	1	1	3	0	0	0	0
O. M. Scott & Sons Co. . . . .	1	1	3	0	1	0	0
A. S. Sergeant . . . . .	2	2	6	0	1	0	0
M. L. Shoemaker & Co., Inc. . . . .	1	1	2	1	0	0	0
Smith Agricultural Chemical Co. . . . .	1	1	3	0	0	1	0
Springfield Rendering Co. . . . .	8	8	24	3	1	1	0
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	7	6	21	3	2	1	2
Stimuplant Laboratories, Inc. . . . .	1	1	3	0	0	1	0
Swift & Co., Fertilizer Works . . . . .	2	2	6	0	0	0	0
F. Sylvester & Son . . . . .	1	1	3	0	0	0	0
Synthetic Nitrogen Products Corp. . . . .	1	1	3	0	0	0	0
Tennessee Corp. . . . .	2	2	6	0	0	0	0
Van Horne Chemical Co. . . . .	1	1	3	0	1	0	0
Victory Fertilizer Corp. . . . .	2	2	6	0	0	0	0
Virginia-Carolina Chemical Corp., Baltimore . . . . .	5	5	15	2	0	0	1
Virginia-Carolina Chemical Corp., Richmond . . . . .	3	3	9	0	0	0	1
Vita-Liza Co. . . . .	1	1	3	0	0	1	0
C. P. Washburn Co. . . . .	3	3	9	3	1	0	0
Worcester Rendering Co. . . . .	5	5	15	0	0	1	0

a Several analyses of the same brand have been averaged and recorded in the table as one analysis.

## Summary of Deficiencies in Mixed Fertilizers

	1931.	1932.	1933.
Brands deficient in one element . . . . .	99	59	86
Brands deficient in two elements . . . . .	15	9	6
Brands deficient in three elements . . . . .	0	0	1
Brands deficient in nitrogen . . . . .	23	18	16
Brands deficient in available phosphoric acid . . . . .	57	27	41
Brands deficient in potash . . . . .	49	32	44

## Serious Commercial Shortages in Mixed Fertilizers

AMOUNT OF SHORTAGE PER TON.	NUMBER OF BRANDS ACCORDING TO YEARS.			
	1930.	1931.	1932.	1933.
More than \$5 . . . . .	1	2	none	1
Between \$4 and \$5 . . . . .	1	none	none	none
Between \$3 and \$4 . . . . .	1	1	2	none
Between \$2 and \$3 . . . . .	none	none	none	2
Between \$1 and \$2 . . . . .	1	3	2	1

Of the 287 brands analyzed, 191, or 66.55 per cent, showed no deficiencies. Out of 851 plant food guarantees made, 88.13 per cent were fully maintained. The deficiency table shows the following statistics:

Deficiencies not exceeding  $\frac{1}{4}$  of one per cent, 53.

Deficiencies between  $\frac{1}{4}$  and  $\frac{1}{2}$  of one per cent, 24.

Deficiencies between  $\frac{1}{2}$  and  $\frac{3}{4}$  of one per cent, 12.

Deficiencies more than  $\frac{3}{4}$  of one per cent, 12.

Of the total number of guarantees of each element made, 6 per cent of the nitrogen, 14.4 per cent of the available phosphoric acid, and 15.5 per cent of the potash were not met. Six of the 16 nitrogen deficiencies, 19 of the 41 available phosphoric acid deficiencies, and 28 of the 44 potash deficiencies, did not exceed  $\frac{1}{4}$  of one per cent.

There were 2 less shortages in nitrogen, 14 more in available phosphoric acid, and 12 more in potash, than in 1932.

## Mixing Efficiency Table.

MANUFACTURER.	AVERAGE PERCENTAGE OF PLANT FOOD ABOVE OR BELOW THE MINIMUM GUARANTEE.		
	Nitrogen.	Available Phosphoric Acid.	Potash.
American Agricultural Chemical Co. . . . .	+ .26	+ .25	+ .10
Apothecaries Hall Co. . . . .	+ .34	+ .40	+ .65
Armour Fertilizer Works . . . . .	+ .23	+ .21	+ .20
Berkshire Chemical Co. . . . .	+ .26	+ .30	+ .44
Consolidated Rendering Co. . . . .	+ .16	— .004	+ .17
Eastern States Farmers' Exchange . . . . .	+ .53	+ .73	+ .51
Essex Fertilizer Co. . . . .	+ .29	+ .49	+ .02
International Agricultural Corp. . . . .	+ .17	+ .25	— .06
Lowell Fertilizer Co. . . . .	+ .33	+ .38	+ .07
New England Fertilizer Co. . . . .	+ .16	+ .16	— .08
Old Deerfield Fertilizer Co., Inc. . . . .	+ .29	+ 1.08	+ .48
Olds & Whipple, Inc. . . . .	+ .43	+ .57	+ .47
Pawtucket Rendering Co. . . . .	+ .21	+ .54	+ .28
Piedmont-Mt. Airy Guano Co., Inc. . . . .	+ .07	+ .42	— .03
Rogers & Hubbard Co. . . . .	+ .23	+ .42	+ .14
Springfield Rendering Co. . . . .	+ .11	— .02	+ .01
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	+ .13	+ .19	— .10
Virginia-Carolina Chemical Corp. . . . .	+ .34	— .10	+ .18
Worcester Rendering Co. . . . .	+ .19	+ .06	+ .22

Nineteen different firms registered five or more brands of mixed fertilizer. Based upon composition found as well as upon tonnage sold, the above table shows to what extent each manufacturer was successful in guarding against deficiencies in plant food guarantee in his assembled mixtures. All of the 19 firms provided for a fair margin of overruns in nitrogen; three firms failed to supply enough available phosphoric acid, and four firms failed to supply sufficient potash to meet the average guarantees. In four other cases the overruns were too small to safely care for accidental variations in the composition of the unmixed materials used in assembling the mixtures.

#### **Explanation of Tables of Analyses.**

**Guarantee.** This column gives the manufacturer's claim or guarantee for the three elements of plant food, nitrogen, available phosphoric acid and potash, in the order stated. The grade of each fertilizer is made a part of the trade name and is expressed as nitrogen, available phosphoric acid and water soluble potash, and in that order.

**Commercial Shortages.** In the table designated "Mixtures showing a commercial shortage of \$1 or more per ton," the column headed "Approximate commercial valuation per ton" gives the sum of the valuation of each plant food element computed from the analysis by use of the trade values adopted by the Massachusetts Fertilizer Control for 1933, which appear on a preceding page of the bulletin.

Under the heading "Approximate commercial shortage per ton" is shown the commercial valuation of the deficiencies or tests found below the guarantee after allowance is made for the value of overruns or tests above the guarantee.

Deficiencies are emphasized by boldface type.

**Mixtures Substantially Complying with the Guarantee.** In addition to the analysis of those fertilizers substantially complying with the guarantee, this table includes also those mixtures that are more or less out of balance; that is, having deficiencies in one or more plant food elements, but having overruns which largely offset the value of the deficiencies.

"Number of samples" indicates the number of samples included in the composite which was analyzed.

*Inferior Nitrogen.* The presence of inferior forms of organic nitrogen is indicated by footnotes.

*Potash Forms.* Wherever tests for chlorine showed a sufficient amount present to unite with all of the potash found, the source of the potash is designated as muriate. Wherever insufficient chlorine was found to account for all of the potash it is evident that forms of potash other than muriate were used. In such cases, the figures under the sub-heading "As muriate" do not imply necessarily that muriate of potash was actually added to the mixture, but that chlorine was present, probably from impurities in the fertilizer chemicals, in amounts to account for the percentage of potash indicated. The balance of the potash found is listed under the sub-heading "In forms other than muriate" and may be derived from sulfate, nitrate, or carbonate, as the case may be.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton.

NAME OF MANUFACTURER AND BRAND.	Where Sampled.	Guarantee: Nitrogen—Available Phosphoric Acid—Potash	Approximate Commercial Valuation Per Ton.	Approximate Commercial Shortage Per Ton.	NITROGEN FOUND.				PHOSPHORIC ACID		POTASH (K <sub>2</sub> O) FOUND.	
					In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.	Available.	Total.	As Muriate.	In Forms Other than Muriate.
Collins Seed Service Co. Ver-Best Putting Green Manure International Agricultural Corp. Guano (a) Rogers & Hubbard Co. H Brand 8-16-14 (b) Standard Wholesale Phosphate & Acid Works, Inc. Standard United States 4-8-12	Boston	7-8-2	\$23.45	\$1.63	1.92	.64	3.84	6.40	7.08	7.53	1.11	1.25
	North Dighton	15.25-10.50-1.75	49.44	2.21	1.20	none	12.30	13.50	10.52	10.84	4.36	none
	Warren	8-16-14	29.78	9.63	5.04	.35	1.06	6.45	11.48	12.25	10.14	none
	Hadley	4-8-12	25.39	2.48	2.42	none	1.08	3.50	9.21	9.82	1.40	8.02

<sup>a</sup> One other sample showed a commercial shortage of 25 cents; two other samples were found well up to the guarantee in all three plant food elements.

<sup>b</sup> Only five bags were shipped in this lot; none of them were sold at retail. The fertilizer was returned to the factory and satisfactory settlement was made with the agent. This was the only sample of this brand drawn by our inspectors. The manufacturer states that lots of this brand shipped into Connecticut and Vermont were found well above the guarantee in all three elements.

## Mixtures Substantially Complying with Guarantees.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Acme Guano Co.										
1	Acme 5-8-7 . . . . .	5-8-7 . . . . .	4.18	.88	.60	5.66	7.97	6.08	1.09	
American Agricultural Chemical Co.										
2	A A Aroostook Potato Manure 5-8-7 . . . . .	5-8-7 . . . . .	4.06	.67	.98	5.71	8.00	7.19	—	
1	A A Aroostook Potato Manure 5-8-7 . . . . .	5-8-7 . . . . .	4.32	none	.79	5.11	8.88	7.27	—	
3	A A Aroostook Potato Manure 5-8-7 . . . . .	5-8-7 . . . . .	3.82	.87	.78	5.47	8.42	7.07	—	
2	A A Complete Manure with 10% Potash 4-8-10 . . . . .	4-8-10 . . . . .	2.72	1.24	.88	4.84	8.48	10.06	—	
1	A A Corn Favorite 3-10-4 . . . . .	3-10-4 . . . . .	2.10	none	1.11	3.21	10.72	4.19	—	
5	A A Corn Favorite 3-10-4 . . . . .	3-10-4 . . . . .	2.38	.44	.73	3.55	10.52	4.15	—	
3	A A Corn Favorite 3-10-4 . . . . .	3-10-4 . . . . .	2.14	.67	.83	3.64	10.46	4.11	—	
1	A A Country Club Organic Fertilizer 7-5-2 . . . . .	7-5-2 . . . . .	3.12	none	4.17	7.29	7.46	2.83	.39	
2	A A Country Club Organic Fertilizer 7-5-2 . . . . .	7-5-2 . . . . .	2.78	.79	4.12	7.69	6.31	2.52	—	
2	A A Cranberry Fertilizer 5-6-4 . . . . .	5-6-4 . . . . .	3.30	1.25	.61	5.16	6.57	4.28	—	
1	A A Cranberry Fertilizer 5-6-4 . . . . .	5-6-4 . . . . .	3.14	1.20	.82	5.16	6.31	4.01	—	
1	A A Double Strength Fertilizer 8-16-14 . . . . .	8-16-14 . . . . .	6.36	.77	1.01	8.14	16.08	14.28	—	
2	A A General Crop Fertilizer 2-10-2 . . . . .	2-10-2 . . . . .	1.16	none	1.05	2.21	10.93	2.27	—	
4	A A General Crop Fertilizer 2-10-2 . . . . .	2-10-2 . . . . .	1.58	.19	.37	2.14	10.46	2.27	—	
2	A A General Crop Fertilizer 2-10-2 . . . . .	2-10-2 . . . . .	1.52	.51	.61	2.64	10.91	2.07	—	
1	A A Hi-Grade Tobacco Manure 6-3-6 . . . . .	6-3-6 . . . . .	1.10	.74	4.14	5.98	3.33	—	6.84	
1	A A Monarch Fertilizer 4-8-4 . . . . .	4-8-4 . . . . .	3.54	none	.93	4.47	8.69	4.28	—	
3	A A Monarch Fertilizer 4-8-4 . . . . .	4-8-4 . . . . .	2.76	.50	.77	4.03	8.16	4.22	—	
2	A A Monarch Fertilizer 4-8-4 . . . . .	4-8-4 . . . . .	2.68	.94	.75	4.37	8.10	4.03	—	

1	A A Peerless Fertilizer 4-8-7	4-8-7	2.86	.47	.93	4.26	8.77	7.05
1	A A Peerless Fertilizer 4-8-7	4-8-7	3.42	.40	.54	4.36	8.10	7.48
4	A A Potato Grower 5-8-10	5-8-10	3.86	.85	.55	5.26	8.32	9.83
1	A A Potato Grower 5-8-10	5-8-10	3.76	1.03	.58	5.37	8.03	10.17
1	A A Prolific 10% Potash Fertilizer 2-8-10	2-8-10	1.26	none	.77	2.03	8.27	10.43
2	A A Prolific 10% Potash Fertilizer 2-8-10	2-8-10	1.58	.43	.35	2.36	8.04	10.14
1	A A Red Seal Fertilizer 5-10-5	5-10-5	4.64	none	.53	5.17	10.26	5.82
2	A A Tobacco Starter 5-5-15	5-5-15	2.66	.79	1.56	5.01	5.32	15.06
1	A A Top Dresser 7-6-6	7-6-6	5.56	.90	.75	7.21	6.43	6.18
5	A A Top Dresser 7-6-6	7-6-6	5.94	.51	.76	7.21	6.54	6.16
4	A A Top Dresser 7-6-6	7-6-6	5.96	.85	.45	7.26	6.19	5.87
1	Agrico for Aroostook 5-8-7	5-8-7	4.00	none	1.09	5.09	8.29	6.90
6	Agrico for Aroostook 5-8-7	5-8-7	3.90	.66	.72	5.28	8.60	7.02
8	Agrico for Aroostook 5-8-7	5-8-7	3.52	1.01	.75	5.28	8.29	7.04
8	Agrico for Aroostook with 10% Potash 5-8-10	5-8-10	3.66	.43	.94	5.03	8.09	10.04
4	Agrico for Aroostook with 10% Potash 5-8-10	5-8-10	3.76	.82	.68	5.26	8.29	10.02
3	Agrico for Aroostook with 10% Potash 5-8-10	5-8-10	3.44	.64	.97	5.05	8.04	10.00
1	Agrico for Corn 3-10-6	3-10-6	2.52	none	.49	3.01	10.19	6.07
5	Agrico for Corn 3-10-6	3-10-6	2.28	.09	.93	3.30	10.01	6.38
4	Agrico for Corn 3-10-6	3-10-6	2.50	.14	.63	3.27	10.14	6.55
2	Agrico for Fruit 9-6-6	9-6-6	8.14	1.00	.39	9.53	6.63	5.70
1	Agrico for Better Lawns and Gardens 5-9-6 (old stock)	5-9-6	4.60	1.00	.08	5.68	9.12	6.18
1	Agrico for Lawns, Trees and Shrubs 7-6-6	7-6-6	5.66	.86	.56	7.08	6.38	.53
5	Agrico for Lawns, Trees and Shrubs 7-6-6	7-6-6	5.48	1.19	.54	7.21	6.19	5.85
2	Agrico for Lawns, Trees and Shrubs 7-6-6	7-6-6	5.42	1.63	.70	7.75	6.12	.34
3	Agrico for New England 4-8-10	4-8-10	2.74	.60	1.00	4.34	8.26	9.94
4	Agrico for New England 4-8-10	4-8-10	2.90	.43	.77	4.10	8.23	9.34
3	Agrico for New England 4-8-10	4-8-10	2.62	.97	.93	4.52	8.10	10.17
1	Agrico for Tobacco 6-3-6	6-3-6	1.08	1.15	3.78	6.01	3.38	7.06
3	Agrico for Truck 4-10-5	4-10-5	2.42	.28	.99	3.69	10.08	5.79
4	Agrico for Truck 4-10-5	4-10-5	2.66	1.01	.88	4.55	10.59	4.96
2	Agrico for Truck 4-10-5	4-10-5	3.00	.65	.74	4.39	10.21	5.29

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
American Agricultural Chemical Co. — Concluded.									
2	Bowker's All Round Fertilizer 3-10-4	3-10-4	2.20	none	.81	3.01	10.40	4.05	—
3	Bowker's All Round Fertilizer 3-10-4	3-10-4	2.28	.49	.83	3.60	10.46	4.03	—
2	Bowker's All Round Fertilizer 3-10-4	3-10-4	2.78	.57	.33	3.68	10.08	4.01	—
1	Bowker's Farm & Garden Phosphate 2-10-2	2-10-2	1.32	none	.71	2.03	10.00	2.27	—
3	Bowker's Farm & Garden Phosphate 2-10-2	2-10-2	1.56	.32	.52	2.40	10.08	2.25	—
2	Bowker's Farm & Garden Phosphate 2-10-2	2-10-2	1.36	.59	.60	2.55	10.08	2.04	—
2	Bowker's Market Garden Fertilizer 4-8-4	4-8-4	2.90	.39	.91	4.20	8.35	4.32	—
8	Bowker's Market Garden Fertilizer 4-8-4	4-8-4	2.66	.31	1.06	4.03	8.67	4.01	—
4	Bowker's Market Garden Fertilizer 4-8-4	4-8-4	2.78	.69	.78	4.25	8.17	4.01	—
3	Bowker's Stockbridge Early Crop Manure 5-8-7	5-8-7	3.52	.88	.92	5.32	8.52	7.17	—
6	Bowker's Stockbridge Early Crop Manure 5-8-7	5-8-7	3.76	.63	.63	5.02	8.16	7.04	—
3	Bowker's Stockbridge Early Crop Manure 5-8-7	5-8-7	3.62	1.36	.70	5.68	8.17	6.72	—
1	Bowker's Stockbridge Potato & Vegetable Manure 4-8-10	4-8-10	2.74	.33	1.11	4.18	8.35	9.56	—
6	Bowker's Stockbridge Potatc & Vegetable Manure 4-8-10	4-8-10	2.94	.56	.73	4.23	8.03	6.50	3.23
3	Bowker's Stockbridge Potato & Vegetable Manure 4-8-10	4-8-10	2.98	.90	.62	4.50	8.17	9.81	—
4	Bowker's Stockbridge Truck Manure 4-8-7	4-8-7	2.64	.92	.83	4.39	8.22	6.69	—
2	Bradley's Blood, Bone & Potash Brand 5-8-7	5-8-7	3.60	.76	1.02	5.38	8.72	6.77	—
5	Bradley's Blood, Bone & Potash Brand 5-8-7	5-8-7	3.80	.64	.54	4.98	8.04	7.02	—
4	Bradley's Blood, Bone & Potash Brand 5-8-7	5-8-7	3.72	1.13	.60	5.45	8.17	7.09	—
5	Bradley's Complete Manure with 10% Potash 4-8-10	4-8-10	2.96	.12	1.20	4.28	8.17	9.63	—
2	Bradley's Complete Manure with 10% Potash 4-8-10	4-8-10	2.88	.74	.83	4.45	8.04	9.40	—
1	Bradley's Complete Manure for Potatoes & Vegetables 4-8-7	4-8-7	2.88	.75	.84	4.47	8.56	7.01	—
4	Bradley's Complete Manure for Potatoes & Vegetables 4-8-7	4-8-7	3.06	.04	1.04	4.14	8.35	6.88	—
2	Bradley's Complete Manure for Potatoes & Vegetables 4-8-7	4-8-7	3.06	.59	.64	4.29	8.10	7.02	—

3	Bradley's Eclipse Fertilizer 2-10-2	.	.	.	.	2-10-2	1.42	.20	.46	2.08	10.14	2.09
2	Bradley's Eclipse Fertilizer 2-10-2	.	.	.	.	2-10-2	1.42	.35	.54	2.31	10.21	2.21
5	Bradley's Northland Fertilizer 4-8-4	.	.	.	.	4-8-4	2.64	.61	.78	4.03	8.23	4.11
2	Bradley's Northland Fertilizer 4-8-4	.	.	.	.	4-8-4	3.02	1.07	.50	4.59	8.16	3.78
5	Bradley's XL Fertilizer 3-10-4	.	.	.	.	3-10-4	2.28	.10	.71	3.09	10.14	4.03
3	Bradley's XL Fertilizer 3-10-4	.	.	.	.	3-10-4	2.28	.59	.65	3.52	10.21	4.15
1	E. Frank Coe's Gold Brand Fertilizer 3-10-4	.	.	.	.	3-10-4	2.22	.87	.76	3.85	9.94	3.91
3	Co-Op 4-8-4 Fertilizer	.	.	.	.	4-8-4	2.64	.75	1.19	4.58	8.36	4.13
3	Co-Op 4-8-7 Fertilizer	.	.	.	.	4-8-7	2.58	.59	1.11	4.28	8.23	6.69
3	Co-Op 5-8-7 Fertilizer	.	.	.	.	5-8-7	3.66	1.05	.79	5.50	8.10	7.02
2	Co-Op 5-8-7 Fertilizer	.	.	.	.	5-8-7	3.28	.87	.97	5.12	8.23	7.02
1	Co-Op 7-6-6 Fertilizer	.	.	.	.	7-6-6	5.50	.97	.68	7.15	6.13	5.67
4	Co-Op 8-16-14 Fertilizer	.	.	.	.	8-16-14	6.52	1.57	.57	8.66	16.01	14.07
1	Double A Tobacco Fertilizer 5-3-5	.	.	.	.	5-3-5	.46	1.27	3.56	5.29	2.29	5.85
4	National Complete Tobacco Fertilizer 5-3-5	.	.	.	.	5-3-5	.54	.95	3.95	5.44	3.31	5.33
1	National Market Garden Fertilizer 3-8-4	.	.	.	.	3-8-4	2.44	.86	.45	3.75	7.78	4.09
3	National Pine Tree Brand 4-8-4	.	.	.	.	4-8-4	3.22	.07	.77	4.06	7.72	4.03
1	Sanderson's Formula A 4-8-4	.	.	.	.	4-8-4	2.70	.67	1.09	4.46	8.34	3.86
4	Sanderson's Formula B 4-8-7	.	.	.	.	4-8-7	3.22	.17	.80	4.19	8.23	6.86
1	Special Mixture 6-4-5	.	.	.	.	6-4-5	none	6.30	.16	6.46	5.05	5.74
American Soda Products Co.												
2	Grogreen 3-8-3	.	.	.	.	3-8-3	2.82	.53	2.31	5.66	9.31	1.07
Apothecaries Hall Co.												
2	Liberty Corn 2-10-2	.	.	.	.	2-10-2	1.48	.17	1.01	2.66	10.46	2.23
1	Liberty High Grade Corn 2-12-4	.	.	.	.	2-12-4	1.70	.11	.74	2.55	12.05	4.59



## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Apothecaries Hall Co. — Concluded.									
4	Liberty High Grade Market Gardeners 5-8-7	5-8-7	2.42	1.83	1.02	5.27	7.66	7.71	—
1	Liberty High Grade Market Gardeners 5-8-7	5-8-7	2.52	2.50	.32	5.34	8.16	7.81	—
4	Liberty Market Gardeners Special 4-8-4	4-8-4	2.26	.70	1.30	4.26	8.16	4.30	—
1	Liberty Market Gardeners Special 4-8-4	4-8-4	2.52	1.48	.64	4.64	8.17	5.19	—
2	Liberty Onion Special (Potash as Sulphate) 4-8-7	4-8-7	2.46	.53	1.53	4.52	11.04	—	7.58
1	Liberty Potato & General Crops 4-8-10	4-8-10	2.20	.86	1.29	4.35	8.16	10.23	—
1	Liberty Potato & Market Gardeners (Potash as Muriate) 4-8-7	4-8-7	2.56	.67	1.19	4.42	8.55	7.31	—
1	Liberty Special Fertilizer for Fruit 7-8-6	7-8-6	2.64	4.30	.36	7.30	8.10	6.57	—
1	Liberty Tobacco Special 5-3-5	5-3-5	none	1.77	3.46	5.23	3.82	—	5.99
1	Liberty Tobacco Starter with Potash 5-4-15	5-4-15	none	2.44	2.94	5.38	5.10	—	15.88
2	Liberty Top Dresser for Grass & Grain 8-8-8	8-8-8	6.06	.37	2.08	8.51	8.61	9.23	—
Armour Fertilizer Works									
3	Armours Big Crop Fertilizers 3-10-4	3-10-4	2.04	.45	.56	3.05	10.01	4.01	—
2	Armours Big Crop Fertilizers 4-8-4	4-8-4	3.10	.46	.75	4.31	8.42	4.14	—
5	Armours Big Crop Fertilizers 4-8-4	4-8-4	2.72	.68	.76	4.16	8.04	4.11	—
1	Armours Big Crop Fertilizers 4-8-7	4-8-7	2.96	.54	.77	4.27	7.72	7.23	—
3	Armours Big Crop Fertilizers 4-8-7	4-8-7	2.68	.93	.83	4.44	8.29	7.04	—
1	Armours Big Crop Fertilizers 4-8-10	4-8-10	2.70	.61	.86	4.17	8.04	9.57	—
2	Armours Big Crop Fertilizers 4-8-10	4-8-10	3.06	.68	.58	4.32	8.41	10.02	—

1	Armours Big Crop Fertilizers 4-16-4	.	.	.	.	.	3.30	.72	.19	4.21	16.07	4.34	-
1	Armours Big Crop Fertilizers 5-8-7	.	.	.	.	.	3.44	.65	.81	4.90	8.00	7.30	-
5	Armours Big Crop Fertilizers 5-8-7	.	.	.	.	.	3.18	.74	1.01	4.93	8.17	7.52	-
2	Armours Big Crop Fertilizers 5-8-7	.	.	.	.	.	3.08	.88	1.16	5.12	8.48	7.46	-
2	Armours Big Crop Fertilizers 6-11-10	.	.	.	.	.	5.06	1.18	.23	6.47	11.16	9.16	.57
2	Armours Big Crop Fertilizers 7-6-6	.	.	.	.	.	6.26	.63	.20	7.09	6.44	5.85	-
3	Armours Big Crop Fertilizers 7-6-6	.	.	.	.	.	6.26	1.01	.34	7.61	6.37	6.07	-
1	Armours Big Crop Fertilizers 8-16-14	.	.	.	.	.	6.56	1.72	.50	8.78	15.43	-	15.22
1	Armours Big Crop Fertilizers Tobacco Special 5-3-5	.	.	.	.	.	.18	2.59	2.48	5.25	3.25	-	5.33
2	Armours Big Crop Fertilizers Tobacco Special 6-3-6	.	.	.	.	.	.26	2.85	3.36	6.47	3.25	-	6.34
1	Armours Big Crop Fertilizers Tobacco Starter 5-5-15	.	.	.	.	.	.16	4.70	.46	5.32	5.10	-	15.91
1	Armours Vert — The Green Colored Plant Food 5-8-6	.	.	.	.	.	4.50	.76	.22	5.48	12.53	4.60	1.77
<b>Barrie Laboratories, Inc.</b>													
1	Barrie's Plant Food 6-7-6	.	.	.	.	.	.54	.95	5.38	6.87	8.54	4.15	2.85
1	Barrie's Plant Food (old stock)	.	.	.	.	.	.74	1.77	5.03	7.54	7.08	8.28	-
<b>F. A. Bartlett Tree Expert Co., Inc.</b>													
2	Bartlett Green Tree Food 6-7-4	.	.	.	.	.	5.16	.43	1.02	6.61	7.98	4.54	-
<b>Berkshire Chemical Co.</b>													
1	Berkshire Asparagus Special Fertilizer 5-12-6	.	.	.	.	.	3.84	.10	1.46	5.40	12.06	6.51	-
2	Berkshire Complete Tobacco Fertilizer 4-3-5	.	.	.	.	.	.36	1.70	1.98	4.04	3.38	-	5.95
1	Berkshire Economical Grass Fertilizer 8-3-8	.	.	.	.	.	.14	7.17	.99	8.30	7.34	2.26	6.44
1	Berkshire Economical Grass Fertilizer 8-3-8	.	.	.	.	.	.10	7.50	.86	8.46	6.51	2.46	6.32
4	Berkshire Grass Special Fertilizer 6-6-5	.	.	.	.	.	4.28	none	2.16	6.44	6.57	5.40	-
2	Berkshire High Grade Tobacco Fertilizer 5-3-6	.	.	.	.	.	.16	2.17	3.07	5.40	3.24	-	6.72
4	Berkshire High Grade Tobacco Fertilizer 5-3-6	.	.	.	.	.	.22	2.24	2.70	5.16	3.06	-	6.80
2	Berkshire High Grade Tobacco Fertilizer 5-3-6	.	.	.	.	.	.08	2.09	2.83	5.00	3.25	-	6.71

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Berkshire Chemical Co. — Concluded.									
1	Berkshire Long Island Special Fertilizer 4-8-7	4-8-7	2.84	.03	1.25	4.12	8.97	7.95	—
2	Berkshire Long Island Special Fertilizer 4-8-7	4-8-7	2.76	none	1.43	4.19	8.45	7.83	—
3	Berkshire Long Island Special Fertilizer 4-8-7	4-8-7	3.02	.17	.87	4.06	8.36	7.56	—
1	Berkshire Long Island Special Fertilizer 4-8-7	4-8-7	2.42	.27	1.49	4.18	7.65	7.54	—
1	Berkshire Market Garden Fertilizer 4-8-4	4-8-4	2.24	.23	2.05	4.52	8.05	4.44	—
6	Berkshire Market Garden Fertilizer 4-8-4	4-8-4	2.62	none	1.77	4.39	8.33	4.14	—
2	Berkshire Market Garden Fertilizer 4-8-4	4-8-4	2.62	.19	1.32	4.13	7.97	4.65	—
1	Berkshire Union Special Fertilizer 4-10-4	4-10-4	2.46	.30	1.55	4.31	10.49	4.18	—
1	Berkshire Union Special Fertilizer 4-10-4	4-10-4	2.46	.46	1.36	4.28	10.40	3.90	—
1	Berkshire Tobacco Special Fertilizer 6-3-7	6-3-7	none	2.26	3.91	6.17	3.13	—	8.30
3	Berkshire Tobacco Starter Fertilizer 4-4-15	4-4-15	.46	2.23	1.42	4.11	4.08	—	15.31
1	Berkshire Tobacco Starter Fertilizer 4-4-15	4-4-15	.34	2.50	1.34	4.18	4.08	—	15.49
2	Berkshire Truck Fertilizer 4-8-5	4-8-5	2.60	none	1.58	4.18	8.56	5.52	—
4	Berkshire Truck Fertilizer 4-8-5	4-8-5	2.68	.11	1.49	4.28	8.03	3.70	1.30
2	Berkshire 5-8-7 Fertilizer	5-8-7	3.24	none	1.93	5.17	8.93	7.17	—
1	Berkshire 5-8-7 Fertilizer	5-8-7	4.06	none	1.24	5.30	8.17	7.29	—
Joseph Breck & Sons Corp.									
1	Breck's Special Market Garden Manure 5-8-7	5-8-7	2.50	.99	1.81	5.30	8.49	4.11	2.60
Clay & Son, Ltd.									
2	Clay's Fertilizer 4-8-2	4-8-2	2.08	.71	2.65	5.44	10.46	1.08	1.69
1	Clay's Fertilizer (old stock)	4-1.12-.08	2.00	.14	2.77	4.91	5.55	.25	—

## Cobwell Reduction Co., Inc.

1 Coreco Chemically Balanced Fertilizer 4-6-2 . . . . .

## Collins Seed Service Co.

4 Casta-Poma Grass Manure 5-6-2 . . . . .

3 Complete Grass Manure 6-8-1 . . . . .

## Consolidated Rendering Co.

1 Coreco 5-8-7 With Magnesium (a) . . . . .

3 Coreco 5-8-7 With Magnesium (a) . . . . .

1 Coreco 5-16-7 . . . . .

5 Coreco 7-13-11 "It Cuts the Cost" . . . . .

4 Coreco 8-16-14 Two-in-One . . . . .

1 New England 8-6-2 Putting Green Special . . . . .

## Daggett Chocolate Co.

1 Vita-Liza . . . . .

1 Davey Tree Expert Co.

1 Davey Tree Food 10-3-3 . . . . .

Eastern States Farmers' Exchange

1 Eastern States 0-14-6 (c) . . . . .

1 Eastern States 0-14-6 (c) . . . . .

1 Eastern States 0-20-20 (d) . . . . .

6 Eastern States 4-8-8 (e) . . . . .

4 Eastern States 4-8-8 (e) . . . . .

5 Eastern States 4-8-8 (e) . . . . .

a Magnesium oxide guaranteed, 1%: found in 1 sample, 1.93%; found in composite of 3 samples, 1.23%.

b The water insoluble organic nitrogen was of inferior quality.

c Magnesium oxide guaranteed, 1.5%: found in 1 sample, 2.32%; found in 1 sample, 2.46%.

d Magnesium oxide guaranteed, 2.5%: found, 2.54%.

e Magnesium oxide guaranteed, .8%: found in composite of 6 samples, 1.67%; found in composite of 4 samples, 1.30%; found in composite of 5 samples, 1.09%.

		4-6-2	2.04	.22	2.20	4.46	6.57	2.83	
1	Coreco Chemically Balanced Fertilizer 4-6-2 . . . . .		2.04	.22	2.20	4.46	6.57	2.83	
	<b>Collins Seed Service Co.</b>								
4	Casta-Poma Grass Manure 5-6-2 . . . . .	5-6-2	2.12	.24	3.37	5.73	6.76	1.48	1.27
3	Complete Grass Manure 6-8-1 . . . . .	6-8-1	1.86	1.60	2.94	6.40	7.27	1.03	.68
	<b>Consolidated Rendering Co.</b>								
1	Coreco 5-8-7 With Magnesium (a) . . . . .	5-8-7	3.18	.85	1.05	5.08	7.99	7.04	
3	Coreco 5-8-7 With Magnesium (a) . . . . .	5-8-7	3.62	1.08	.77	5.47	8.04	7.11	
1	Coreco 5-16-7 . . . . .	5-16-7	2.84	.67	1.51	5.02	15.95	7.36	
5	Coreco 7-13-11 "It Cuts the Cost" . . . . .	7-13-11	4.88	.74	1.41	7.03	13.21	11.18	
4	Coreco 8-16-14 Two-in-One . . . . .	8-16-14	5.44	1.08	1.53	8.05	15.44	14.05	
1	New England 8-6-2 Putting Green Special . . . . .	8-6-2	5.32	.11	3.10	8.53	6.51	2.36	
	<b>Daggett Chocolate Co.</b>								
1	Vita-Liza . . . . .	4.5-1.5-2	none	.87	3.75 <sup>b</sup>	4.62	.83		2.13
	<b>Davey Tree Expert Co.</b>								
1	Davey Tree Food 10-3-3 . . . . .	10-3-3	5.42	1.48	3.10	10.00	3.06	1.81	.85
	<b>Eastern States Farmers' Exchange</b>								
1	Eastern States 0-14-6 (c) . . . . .	0-14-6	-	-	-	-	14.73	6.49	-
1	Eastern States 0-14-6 (c) . . . . .	0-14-6	-	-	-	-	14.80	6.74	-
1	Eastern States 0-20-20 (d) . . . . .	0-20-20	-	-	-	-	20.28	20.61	-
6	Eastern States 4-8-8 (e) . . . . .	4-8-8	3.42	.84	.35	4.61	8.80	8.26	-
4	Eastern States 4-8-8 (e) . . . . .	4-8-8	3.36	.87	.40	4.63	8.74	8.41	-
5	Eastern States 4-8-8 (e) . . . . .	4-8-8	3.30	.88	.46	4.64	9.51	8.04	-

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Eastern States Farmers' Exchange—Concluded									
1	Eastern States 4-10-6 (a)	4-10-6	3.18	.86	.42	4.46	10.72	4.81	2.00
4	Eastern States 4-10-6 (a)	4-10-6	3.12	1.26	.38	4.76	10.65	5.09	1.63
3	Eastern States 4-12-4 (b)	4-12-4	2.64	1.13	.62	4.39	12.76	—	4.41
7	Eastern States 4-12-4 (b)	4-12-4	2.64	1.30	.68	4.62	12.76	—	4.63
3	Eastern States 4-12-4 (b)	4-12-4	2.60	1.37	.74	4.71	12.12	—	4.77
1	Eastern States 4-16-20 (c)	4-16-20	2.92	.81	.72	4.45	16.08	22.84	—
1	Eastern States 4-16-20 (c)	4-16-20	2.96	.73	.84	4.53	16.39	22.29	—
1	Eastern States 6-3-6 Cranberry	6-3-6	.16	5.14	.38	5.68	13.08	—	7.04
6	Eastern States 6-8-6 (d)	6-8-6	3.94	1.55	.96	6.45	8.80	—	6.59
4	Eastern States 6-8-6 (d)	6-8-6	3.82	1.82	.83	6.47	8.86	—	6.55
3	Eastern States 6-15-9 (e)	6-15-9	4.60	1.36	.50	6.46	16.39	5.71	3.81
1	Eastern States 6-15-9 (e)	6-15-9	4.50	1.50	.47	6.47	14.79	6.53	3.39
1	Eastern States 8-4-8 Tobacco (f)	8-4-8	.18	2.43	5.54	8.15	4.91	—	9.34
4	Eastern States 8-16-16 (g)	8-16-16	6.06	1.67	.67	8.40	16.98	13.76	3.16
5	Eastern States 8-16-16 (g)	8-16-16	6.04	1.74	.69	8.47	16.08	13.06	3.55
5	Eastern States 8-16-16 (g)	8-16-16	6.02	1.52	.75	8.29	15.86	12.40	3.94
1	Eastern States 8-16-16 Low Chlorine Special (h)	8-16-16	5.68	1.60	.94	8.22	18.04	—	15.22
2	Eastern States 8-24-8 (i)	8-24-8	5.50	2.42	.62	8.54	24.44	—	8.24
2	Eastern States 8-24-8 (i)	8-24-8	5.28	3.03	.59	8.90	23.53	—	9.75
1	Eastern States 10-5-10 Tobacco (j)	10-5-10	.36	2.30	8.02	10.68	5.55	—	11.07
1	Eastern States 10-5-10 Tobacco (j)	10-5-10	.38	3.32	6.44	10.14	5.49	—	12.27

2	Eastern States 10-20-20 (k)	.	.	.	.	10-20-20	7.10	2.34	78	10.22	20.23	16.43	5.83
2	Eastern States 10-20-20 (k)	.	.	.	.	10-20-20	7.52	2.75	.40	10.67	19.32	14.21	6.99
4	Eastern States 15-20-15 (l)	.	.	.	.	15-20-15	8.42	3.07	3.83	15.32	20.62	4.03	11.07
1	Eastern States 18-6-6	.	.	.	.	18-6-6	6.24	6.24	5.06 <sup>m</sup>	18.14	6.93		7.20
1	Eastern States 18-6-6	.	.	.	.	18-6-6	6.60	6.46	3.80 <sup>m</sup>	16.86	7.21	.90 <sup>n</sup>	6.29
1	Eastern States 18-6-6	.	.	.	.	18-6-6	6.14	6.73	4.89	17.76	6.44		6.89
1	Nitrophoska 10-20-20	.	.	.	.	10-20-20	7.54	none	2.94	10.48	21.46	21.05	-
<b>Thomas W. Emerson Co.</b>													
1	Emerson's "English Formula" Lawn and Garden Dressing 5-7-2	.	.	.	.	5-7-2	.60	.09	4.40	5.09	5.90	1.48	.87
<b>Essex Fertilizer Co.</b>													
1	Essex 2-10-2 AI Super	.	.	.	.	2-10-2	1.32	none	.99	2.31	10.40	2.09	-
2	Essex 2-10-2 AI Super	.	.	.	.	2-10-2	1.58	.13	.75	2.46	10.27	2.81	-
4	Essex 3-10-4 Fish Brand Fertilizer for all Crops	.	.	.	.	3-10-4	2.18	none	1.02	3.20	10.33	3.91	-
4	Essex 4-8-4 Market Garden	.	.	.	.	4-8-4	2.52	.51	1.34	4.37	8.67	4.07	-
4	Essex 4-8-4 Market Garden	.	.	.	.	4-8-4	2.90	.71	.62	4.23	8.22	4.21	-
1	Essex 4-8-7 Old General Crop Manure for Potatoes and Market Garden Crops	.	.	.	.	4-8-7	2.72	.31	1.20	4.23	8.10	7.00	-
1	Essex 4-8-7 Old General Crop Manure for Potatoes and Market Garden Crops	.	.	.	.	4-8-7	1.52	1.29	1.36	4.17	8.23	7.02	-
5	Essex 4-8-10 Peerless Potato Manure	.	.	.	.	4-8-10	2.98	.63	.92	4.53	8.17	9.77	-
5	Essex 5-8-7 Complete Manure	.	.	.	.	5-8-7	3.88	.43	.85	5.16	8.70	7.13	-
2	Essex 5-8-7 Complete Manure	.	.	.	.	5-8-7	3.68	.82	.95	5.45	8.48	6.86	-

<sup>a</sup> Magnesium oxide guaranteed, .8%; found in 1 sample, 1.09%; found in composite of 4 samples, 1.45%.

<sup>b</sup> Magnesium oxide guaranteed, .8%; found in composite of 3 samples, 1.45%; found in composite of 7 samples, 1.23%; found in composite of 3 samples, 1.16%.

<sup>c</sup> Magnesium oxide guaranteed, .6%; found in 1 sample, 2.03%; found in 1 sample, 1.74%.

<sup>d</sup> Magnesium oxide guaranteed, .8%; found in composite of 6 samples, 1.88%; found in composite of 4 samples, 1.67%.

<sup>e</sup> Magnesium oxide guaranteed, 1.2%; found in composite of 3 samples, 2.17%; found in 1 sample, 1.52%.

<sup>f</sup> Magnesium oxide guaranteed, 1.54%; found, 1.96%.

<sup>g</sup> Magnesium oxide guaranteed, 1.6%; found in composite of 4 samples, 2.39%; found in composite of 5 samples, 2.39%; found in composite of 5 samples, 2.24%.

<sup>h</sup> Magnesium oxide guaranteed, 1.6%; found, 1.88%.

<sup>i</sup> Magnesium oxide guaranteed, 1.6%; found in composite of 2 samples, 1.67%; found in composite of 2 samples, 1.88%.

<sup>j</sup> Magnesium oxide guaranteed, 1.7%; found in 1 sample, 2.03%; found in 1 sample, 2.32%.

<sup>k</sup> Magnesium oxide guaranteed, 2%; found in composite of 2 samples, 2.24%; found in composite of 2 samples, 2.32%.

<sup>l</sup> Magnesium oxide guaranteed, 2%; found in composite of 4 samples, 2.10%.

<sup>m</sup> The water insoluble nitrogen was of inferior quality.

<sup>n</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid—Potash	NITROGEN FOUND.				POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.	As Muriate.	In Forms Other than Muriate.
	<b>Essex Fertilizer Co. — Concluded.</b>							
1	Essex 5-8-10 Aroostook Special for Potatoes	5-8-10	3.74	.75	.90	5.39	9.90	—
1	Essex 5-8-10 Aroostook Special for Potatoes	5-8-10	3.60	1.01	1.06	5.67	9.61	—
3	Essex 7-6-6 Top Dressing	7-6-6	6.68	.32	.31	7.31	5.76	—
1	Essex 7-6-6 Top Dressing	7-6-6	6.38	.30	.52	7.20	6.09	—
	<b>L. T. Frisbie Co.</b>							
1	Frisbie's Special 5-8-7	5-8-7	3.60	.75	.96	5.31	—	7.58
	<b>H. L. Frost &amp; Co.</b>							
2	Frost's Evergreen Special 8-6-3	8-6-3	1.50	1.48	4.19	7.17	3.33	—
	<b>Gouldard &amp; Olena, Inc.</b>							
3	G & O Lawn & Garden No-Filler Fertilizer 5-8-5	5-8-5	2.32	none	2.69	5.01	5.14	—
1	G & O Lawn & Garden No-Filler Fertilizer 5-8-5	5-8-5	2.14	.63	2.28	5.05	5.21	—
	<b>Grasselli Chemical Co.</b>							
1	Grasselli Plant Food (old stock)	4.12-13-4	3.66	none	.43	4.09	4.77	—
	<b>T. J. Grey Co.</b>							
1	Grey's 9-6-6 Plant Food for Lawns, etc.	9-6-6	7.84	.88	.61	9.33	5.75	.45
	<b>Thomas Hersom &amp; Co.</b>							
2	Neverfail 4-8-4	4-8-4	2.46	1.29	1.02	4.77	4.24	—
2	Neverfail 5-8-7	5-8-7	3.56	.56	.97	5.09	7.04	—
1	Neverfail 5-8-7	5-8-7	3.70	.38	1.18	5.26	7.04	—

International Agricultural Corp.									
1	International 3-10-4	.	.	.	.	.	.	.	4.15
4	International 3-10-4	2.64	none	.58	3.22	10.59	4.22	—	—
		2.70	.11	.53	3.34	10.46			
1	International 4-8-4	3.66	none	.54	4.20	8.52	4.30	—	—
7	International 4-8-4	3.54	.42	.39	4.35	8.03	4.11	—	—
1	International 4-8-7	3.52	none	.52	4.04	8.75	6.92	—	—
2	International 4-8-7	3.40	.22	.62	4.24	8.04	7.02	—	—
6	International 4-8-10	3.64	none	.69	4.33	8.74	9.87	—	—
7	International 5-8-7	4.24	none	.84	5.08	8.34	6.79	—	—
2	International 5-8-7	4.44	.19	.51	5.14	7.78	7.07	—	—
6	International 7-6-6	6.14	none	.82	6.96	6.00	6.14	—	—
1	International 8-16-14	7.16	.03	.88	8.07	16.27	14.02	—	—
1	International 8-16-14	7.02	none	.81	7.83	16.47	13.76	—	—
4	International 8-16-14	7.50	.49	.19	8.18	16.39	13.72	—	—
4	International Caribbee 5-8-7	2.40	.74	1.90	5.04	8.25	3.74	3.41	
1	International Caribbee 5-8-7	2.56	.87	1.87	5.30	8.10	4.19	2.69	
3	International Caribbee 5-10-10	1.24	1.45	2.52	5.21	10.40	1.93	8.09	
3	International Caribbee 7-12-10	2.98	1.32	2.67	6.97	12.35	1.56	8.01	
1	International Caribbee 7-12-10	3.26	1.57	2.28	7.11	12.11	1.23	9.00	
1	International Caribbee 10-16-20	6.90	1.31	1.97	10.18	17.28	16.72	3.28	
6	International Caribbee 10-16-20	6.38	1.80	2.22	10.40	16.01	16.43	3.61	
1	Caribbee Peruvian Guano	2.22	none	12.50	14.72	10.78	2.58	—	—
2	Caribbee Peruvian Guano (a)	2.46	none	14.04	16.50	10.58	1.94	—	—
	Little-Tree Farms								
1	Little Tree Farms Plant Food 5-8-5	3.44	.06	2.19	5.69	11.22	2.16	2.96	
	Lowell Fertilizer Co.								
4	Lowell 2-10-2 Bone Brand	1.22	none	1.02	2.24	10.23	2.17	—	—
1	Lowell 2-10-2 Bone Brand	1.16	.22	.91	2.29	10.27	2.05	—	—

a One other sample was deficient; see analysis in table of "Mixtures showing a commercial shortage of \$1 or more per ton."



## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Lowell Fertilizer Co. — Concluded.										
2	Lowell 3-10-4 Animal Brand, A High Grade Manure for all Crops	3-10-4	1.94	.31	1.08	3.33	10.08	4.05	—	
1	Lowell 3-10-4 Animal Brand, A High Grade Manure for all Crops	3-10-4	2.26	.23	.83	3.32	10.66	4.30	—	
10	Lowell 4-8-4 Corn and Vegetable	4-8-4	2.78	.43	1.11	4.32	8.58	4.21	—	
1	Lowell 4-8-4 Corn and Vegetable	4-8-4	3.02	.64	.62	4.28	8.04	4.01	—	
2	Lowell 4-8-7 Old General Crop Manure for Potatoes and Market Garden Crops	4-8-7	2.22	.66	1.32	4.20	8.10	7.04	—	
4	Lowell 4-8-10 Potato Grower	4-8-10	2.74	.68	.90	4.32	8.48	10.27	—	
4	Lowell 4-8-10 Potato Grower	4-8-10	2.98	.69	.93	4.60	8.04	10.16	—	
9	Lowell 5-8-7 Market Garden Manure	5-8-7	3.62	.63	1.05	5.30	8.42	7.00	—	
2	Lowell 5-8-7 Market Garden Manure	5-8-7	3.72	.70	.93	5.35	8.04	6.69	—	
2	Lowell 5-8-10 Aroostook Special for Potatoes	5-8-10	3.76	.55	.86	5.17	8.19	10.02	—	
1	Lowell 5-8-10 Aroostook Special for Potatoes	5-8-10	3.98	.69	.80	5.47	8.35	10.35	—	
3	Lowell 7-6-6 Top Dressing	7-6-6	6.84	.21	.58	7.63	6.04	6.07	—	
3	Lowell 7-6-6 Top Dressing	7-6-6	6.52	.30	.65	7.47	6.12	6.18	—	
2	Lowell 7-8-5 Complete Fruit	7-8-5	4.80	.47	1.35	6.62	8.04	5.72	—	
1	Ropes Special 3-8-4	3-8-4	2.50	.48	.71	3.69	10.78	4.03	—	
1	Ropes Special 4-6-10	4-6-10	2.62	.49	1.30	4.41	8.10	10.19	—	
Maine Farmers Exchange, Inc.										
2	M. F. E. Produce-More 4-8-4	4-8-4	3.20	.09	.88a	4.17	8.41	2.55	1.87	

2	M. F. E. Produce-More 5-8-7	5-8-7	3.90	.39	.78a	5.07	8.54	6.82	-
	<b>Miller Fertilizer Co.</b>								
1	Miller's Crop Grower 5-8-7	5-8-7	4.20	.07	.74	5.01	8.34	6.82	-
1	Miller's Onion & Vegetable 4-8-4	4-8-4	3.22	.19	.77	4.18	8.16	4.19	-
	<b>New England Fertilizer Co.</b>								
2	New England 2-10-2 Corn Phosphate	2-10-2	1.40	.26	.89	2.55	10.27	2.13	-
4	New England 3-10-4 Super A High Grade Fertilizer for all Crops	3-10-4	2.20	none	1.01	3.21	10.26	3.95	-
2	New England 3-10-4 Super A High Grade Fertilizer for all Crops	3-10-4	2.36	.08	.90	3.34	10.20	4.07	-
2	New England 4-8-4 Potato and Vegetable Manure	4-8-4	2.64	.59	1.03	4.26	8.16	4.07	-
3	New England 4-8-4 Potato and Vegetable Manure	4-8-4	2.88	.55	.64	4.07	8.23	4.17	-
2	New England 4-8-7 Old General Crop Manure for Potatoes and Market Garden Crops	4-8-7	2.92	.47	.99	4.38	8.10	7.11	-
5	New England 4-8-10 Complete Manure	4-8-10	2.46	.67	.88	4.01	7.93	10.02	-
2	New England 4-8-10 Complete Manure	4-8-10	2.60	.79	.88	4.27	8.10	10.00	-
5	New England 5-8-7 Market Garden Manure	5-8-7	3.50	.43	1.14	5.07	8.17	6.78	-
1	New England 5-8-7 Market Garden Manure	5-8-7	3.68	.40	1.04	5.12	8.17	7.00	-
1	New England 5-8-10 Aroostook Special for Potatoes	5-8-10	3.98	.44	.77	5.19	8.29	10.27	-
2	New England 7-6-6 Top Dressing	7-6-6	6.66	.37	.65	7.68	6.12	5.52	-
	<b>Nitrate Agencies Co.</b>								
2	NACO 7-5-2	7-5-2	1.12	.70	5.52	7.34	5.74	2.11	-
1	NACO 7-5-2	7-5-2	1.68	.47	5.02	7.17	5.55	2.40	-
	<b>Old Deerfield Fertilizer Co., Inc.</b>								
1	Old Deerfield 3-10-6, Corn & Seeding	3-10-6	1.06	.43	1.78	3.27	12.05	5.67	.57
1	Old Deerfield 4-6-10	4-6-10	.20	1.29	3.12	4.61	7.87	-	10.91
1	Old Deerfield 4-8-4, General Crops	4-8-4	1.10	.96	2.23	4.29	8.78	-	4.34
1	Old Deerfield 4-8-7, Market Garden	4-8-7	1.12	1.04	1.91	4.07	8.90	7.13	-

a The water insoluble organic nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Old Deerfield Fertilizer Co., Inc.— Concluded.									
1	Old Deerfield 4-8-7, Potato (Potash other than Muriate)	4-8-7	1.20	1.04	2.00	4.24	8.94	—	7.85
1	Old Deerfield 5-3-5, Tobacco	5-3-5	.14	1.08	4.29	5.51	4.44	—	5.99
2	Old Deerfield 5-8-7, Set Onion	5-8-7	1.18	1.24	2.89	5.31	9.50	7.02	—
1	Old Deerfield 5-8-7, Set Onion (Potash other than Muriate)	5-8-7	1.62	1.21	2.44	5.27	8.93	—	7.23
3	Old Deerfield 5-8-12, Tobacco Starter	5-8-12	.48	1.78	3.14	5.40	9.28	—	12.95
1	Old Deerfield 6-3-7, Complete Tobacco	6-3-7	.26	.70	5.21	6.17	4.30	—	7.54
1	Old Deerfield 7-6-6, Grass Top Dressing	7-6-6	3.92	2.24	1.04	7.20	6.57	4.44	1.84
1	Old Deerfield 8-16-14, Potato	8-16-14	3.12	1.61	3.10	7.83	16.63	11.00	4.10
2	Old Deerfield Lawnshrub 5-5-5	5-5-5	1.18	.30	4.15	5.63	4.90	5.45	—
1	Valley Brand 4-8-4	4-8-4	3.36	.11	.86	4.33	9.25	4.32	—
1	Valley Brand 4-8-7	4-8-7	3.38	.10	.87	4.35	9.12	7.17	—
1	Valley Brand 5-8-7	5-8-7	3.38	.35	1.74	5.47	8.23	7.25	—
Olds & Whipple, Inc.									
5	"Luxura" 5-8-6	5-8-6	2.32	.46	2.65	5.43	10.40	6.57	.15
1	"Luxura" 5-8-6	5-8-6	2.34	1.34	2.10	5.78	10.46	6.49	—
1	O & W Blue Label Tobacco Fertilizer 6-3-6	6-3-6	.20	.93	5.01	6.14	3.51	—	6.63
2	O & W Complete Tobacco Fertilizer 5-3-5	5-3-5	.20	1.17	4.05	5.42	3.25	—	5.54

1	O & W High Grade Potato & Vegetable Fertilizer 5-8-7	5-8-7	2.52	.98	1.53	5.03	8.29	-	7.34
3	O & W Market Garden Fertilizer 4-8-4	4-8-4	2.48	1.03	.80	4.31	8.33	4.36	-
2	O & W Market Garden Fertilizer (Sulphate) 4-8-4	4-8-4	2.06	.69	1.29	4.04	8.44	-	4.59
1	O & W 4-8-7 Potato & General Purpose Fertilizer	4-8-7	1.90	.93	1.22	4.05	7.85	7.29	-
1	O & W 8-6-6 Top Dressing and Grass Fertilizer	8-6-6	1.80	4.09	2.32	8.21	6.88	6.59	-
1	Wilcox Market Garden 4-8-4	4-8-4	2.06	.66	1.61	4.33	9.05	4.21	-
1	Wilcox Potato & General Purpose 4-8-7	4-8-7	2.14	1.07	1.35	4.56	8.03	7.77	-
1	J. W. Alsop, Inc., Special Tobacco Formula	2-0-8	.04	.08	2.63	2.75	2.29	-	10.07
1	Special Mixture (Mrs. Fannie G. Carl)	5.5-3-8	.38	2.85	3.10	6.33	3.76	-	8.23
<b>Pawtucket Rendering Co.</b>									
1	Pawtucket 2-10-2 Brand	2-10-2	1.06	.07	1.18	2.31	9.83	2.15	-
4	Pawtucket 4-8-4 Brand	4-8-4	2.50	.41	1.26	4.17	8.01	4.44	-
4	Pawtucket 5-8-7 Brand	5-8-7	3.20	.53	1.48	5.21	8.10	7.54	-
1	Pawtucket 8-6-6 Brand	8-6-6	6.38	.75	1.02	8.15	6.31	6.36	-
2	Special Mixture (Rehoboth Farmers' Association)	4.8-9-9	2.22	1.11	1.68	5.01	9.95	9.08	-
<b>Pedigreed Seed Co., Inc.</b>									
1	Laguna Special Turf Fertilizer 5-8-6	5-8-6	3.02	.66	1.48	5.16	7.39	6.90	-
<b>F. G. Phillips Co.</b>									
3	FertiFlora 3-3-3	3-3-3	1.44	2.20	none	3.64	3.25	-	3.70
<b>Piedmont-Mt. Airy Guano Co., Inc.</b>									
2	Piedmont Harvest Brand 2-8-2	2-8-2	1.38	none	.69a	2.07	8.80	2.38	-
1	Harvest Brand 2-12-4	2-12-4	1.16	.06	.86a	2.08	11.74	4.28	-
4	Harvest Brand 3-8-4	3-8-4	2.48	none	.57	3.05	8.62	4.15	-
1	Harvest Brand 4-6-10	4-6-10	3.20	.27	.60	4.07	7.01	9.24	-

<sup>a</sup> The water insoluble organic nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Piedmont-Mt. Airy Guano Co., Inc. — Concluded.									
5	Piedmont Harvest Brand 4-8-4	4-8-4	3.40	.15	.50 <sup>a</sup>	4.05	8.23	4.17	—
4	Piedmont Harvest Brand 5-8-7	5-8-7	4.02	.23	.87	5.12	8.16	7.02	—
Plantabbs Corp.									
2	Fulton's Plantabbs 11-15-20	11-15-20	3.62	7.36	.02	11.00	18.75	—	25.24
1	Fulton's Plantabbs 11-15-20	11-15-20	3.56	7.49	.34	11.39	18.88	—	25.28
Rogers & Hubbard Co.									
1	Golf Course Fertilizer 8-6-2	8-6-2	1.96	.42	5.81	8.19	6.12	2.22	.44
1	Gro-Fast Fertilizer 5-6-6 (old stock)	5-6-6	1.22	1.81	2.24	5.27	6.06	5.06	.73
1	Gro-Fast Fertilizer 5-6-6	5-6-6	1.44	.11	3.77	5.32	6.19	—	7.09
4	Hubbard's All Soils-All Crops Fertilizer 4-8-4	4-8-4	2.72	.38	1.13	4.23	8.18	4.21	—
1	Hubbard's All Soils-All Crops Fertilizer 4-8-4	4-8-4	3.20	.60	.91	4.71	8.29	4.09	—
4	Hubbard's "Bone Base" Fertilizer for Seeding Down 3-7-6	3-7-6	1.32	.12	1.76	3.20	10.72	6.61	—
6	Hubbard's "Bone Base" Oats and Top Dressing 8-5-8	8-5-8	.08	7.38	.59	8.05	7.85	5.34	2.41
4	Hubbard's "Bone Base" Oats and Top Dressing 8-5-8	8-5-8	.08	7.83	.62	8.53	7.08	8.62	—
3	Hubbard's "Bone Base" Soluble Corn Manure 4-8-7	4-8-7	1.84	.88	1.33	4.05	10.06	7.21	—
1	Hubbard's "Bone Base" Soluble Corn Manure 4-8-7	4-8-7	2.04	1.07	1.20	4.31	9.56	7.09	—
3	Hubbard's "Bone Base" Soluble Potato Manure 5-8-7	5-8-7	2.28	1.13	1.62	5.03	9.06	—	7.25
1	Hubbard's "Bone Base" Soluble Potato Manure 5-8-7	5-8-7	2.32	1.33	1.61	5.26	8.29	1.97	5.18
2	Hubbard's "Bone Base" Soluble Tobacco Manure 5-8-10	5-8-10	1.34	1.98	1.69	5.01	8.86	—	10.37
1	Hubbard's "Bone Base" Soluble Tobacco Manure 5-8-10	5-8-10	1.44	2.06	1.62	5.12	8.29	—	10.10

1	Hubbard's Climax Tobacco Brand 5-3-5	.	.	.	5-3-5	.16	1.48	3.47	5.11	3.69	-	5.25
6	Hubbard's Corn and Grain Fertilizer 2-12-4	.	.	.	2-12-4	1.10	.15	1.04	2.29	11.83	4.05	-
5	Hubbard's Corn and Grain Fertilizer 2-12-4	.	.	.	2-12-4	1.42	.40	.74	2.56	11.54	4.01	-
3	Hubbard's High Potash Fertilizer 2-8-10	.	.	.	2-8-10	1.18	.13	.96	2.27	8.55	10.45	-
2	Hubbard's High Potash Fertilizer 2-8-10	.	.	.	2-8-10	1.10	.19	1.04	2.33	8.03	10.64	-
2	Hubbard's Potato Fertilizer 5-8-7	.	.	.	5-8-7	3.70	none	1.35	5.05	8.14	7.21	-
5	Hubbard's Potato Fertilizer 5-8-7	.	.	.	5-8-7	3.54	.50	1.22	5.26	8.16	7.11	-
5	Hubbard's Potato Fertilizer 5-8-7	.	.	.	5-8-7	3.64	.30	1.22	5.16	7.72	7.00	-
3	Hubbard's Potato Fertilizer 5-8-7	.	.	.	5-8-7	3.48	.34	1.41	5.23	8.04	7.15	-
1	Hubbard's Rose Food 7-10-5	.	.	.	7-10-5	.48	.57	6.42	7.47	10.72	-	6.21
4	Hubbard's Tobacco Grower-Vegetable Formula 6-3-6	.	.	.	6-3-6	.14	1.66	4.26	6.06	3.57	-	6.01
3	Hubbard's Tobacco Grower-Vegetable Formula 6-3-6	.	.	.	6-3-6	.18	1.23	4.50	5.91	3.45	1.23	5.11
4	Hubbard's Tobacco Starter 5-5-15	.	.	.	5-5-15	.12	2.63	2.60	5.35	5.05	-	15.00
1	M. & M. Starter	.	.	.	4-8-2-13	.28	2.44	2.31	5.03	3.95	-	14.07
2	Red H Brand 4-8-4 Fertilizer	.	.	.	4-8-4	3.54	none	.72	4.26	8.47	3.98	-
5	Red H Brand 4-8-4 Fertilizer	.	.	.	4-8-4	3.46	.12	.50	4.08	8.03	4.09	-
6	Red H Brand 4-8-4 Fertilizer	.	.	.	4-8-4	3.30	.43	.61	4.34	8.04	4.71	-
2	Red H Brand 4-8-4 Fertilizer	.	.	.	4-8-4	3.38	.47	.78	4.63	8.04	4.05	-
1	Red H Brand 4-8-7 Fertilizer	.	.	.	4-8-7	3.48	.13	.68	4.29	8.29	6.86	-
7	Red H Brand 5-8-7 Fertilizer	.	.	.	5-8-7	4.26	.11	.83	5.20	8.42	7.00	-
4	Red H Brand 5-8-7 Fertilizer	.	.	.	5-8-7	4.54	.33	.57	5.44	8.04	7.02	-
2	Red H Brand 5-8-7 Fertilizer	.	.	.	5-8-7	4.00	.30	.96	5.26	8.10	7.02	-
7	Red H Brand 7-6-6 Fertilizer	.	.	.	7-6-6	6.10	.17	1.27	7.54	6.15	5.79	-
3	Red H Brand 7-6-6 Fertilizer	.	.	.	7-6-6	5.98	.33	1.03	7.34	6.19	6.03	-
1	4-8-10 Fertilizer	.	.	.	4-8-10	3.48	.22	.58	4.28	7.72	10.14	-
F. S. Royster Guano Co.												
2	Royster Connecticut Tobacco Guano 5-3-5	.	.	.	5-3-5	.10	1.18	3.72	5.00	3.82	-	5.17
2	Royster Tobacco Special 6-3-6	.	.	.	6-3-6	.20	1.28	4.71	6.19	3.82	-	6.55
1	Royster 5% Truck Guano 5-8-7	.	.	.	5-8-7	4.22	.05	.86	5.13	7.72	6.90	-
2	Royster Truckers Delight 4-8-4	.	.	.	4-8-4	3.22	.13	.71	4.06	8.01	4.07	-

<sup>a</sup> The water insoluble organic nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen— Available Phosphoric Acid—Potash	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	
Salem Chemical & Supply Co.										
1	Plant Food 3-4-3	3-4-3	2.84	.06	.14	3.04	4.21	3.41	—	
1	Plant Food (old stock)	2.5-3.5-3	2.66	.06	none	2.72	4.21	3.57	—	
O. M. Scott & Sons Co.										
2	Scott's Turf Builder 10-6-4	10-6-4	6.06	.37	4.03	10.46	4.99	3.29	1.05	
2	Scott's Turf Builder 10-6-4	10-6-4	5.82	.60	3.94	10.36	6.44	3.53	.48	
A. S. Sergeant										
1	Sergeant 3-8-4	3-8-4	2.48	.35	.68	3.51	8.17	3.16	1.22	
1	Sergeant 4-10-5	4-10-5	3.12	.14	.79	4.05	9.70	4.03	1.03	
M. L. Shoemaker & Co., Inc.										
2	"Swift Sure" Tobacco Starter 4-10-0	4-10-0	2.54	.31	1.16	4.01	9.80	—	—	
Smith Agricultural Chemical Co.										
1	Sacco Plant Food	4-12-4	3.70	.38	.42	4.50	11.34	4.07	—	
Springfield Rendering Co.										
2	Springfield 3-10-4 Corn & Grain Fertilizer	3-10-4	2.46	.06	.73	3.25	9.69	4.22	—	
6	Springfield 4-8-4 General Garden Fertilizer	4-8-4	2.58	.47	1.01	4.06	7.81	4.21	—	
3	Springfield 4-8-4 General Garden Fertilizer	4-8-4	2.08	1.08	1.28	4.44	8.17	4.03	—	
1	Springfield 4-8-7 Potato & Vegetable Fertilizer	4-8-7	1.88	.89	1.24	4.01	8.30	6.45	—	
2	Springfield 4-8-10 Complete Manure	4-8-10	2.70	.37	.95	4.02	7.88	10.10	—	

2	Springfield 5-5-5 Lawn & Shrub Fertilizer	.	.	.	5-5-5	2.66	.38	2.49	5.53	5.97	-	5.15
4	Springfield 5-8-7 Market Garden Fertilizer	.	.	.	5-8-7	3.74	.34	.98	5.06	7.83	7.05	-
1	Springfield 6-3-6 Tobacco Special Fertilizer	.	.	.	6-3-6	.16	1.58	4.39	6.13	4.20	-	6.40
4	Springfield 7-6-6 Top Dresser	.	.	.	7-6-6	5.62	.06	1.38	7.06	6.37	6.05	-
<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b>												
1	Standard United States 2 x 8 x 3	.	.	.	2-8-3	1.78	.12	.51	2.41	7.65	5.07	-
1	Standard United States 3 x 8 x 4	.	.	.	3-8-4	2.20	none	.84 <sup>a</sup>	3.04	8.12	2.05	1.85
1	Standard United States 3 x 8 x 4	.	.	.	3-8-4	2.32	.35	.67	3.34	9.02	2.79	1.28
1	Standard United States 4 x 6 x 10	.	.	.	4-6-10	3.02	.34	.53	3.89	6.95	9.12	-
3	Standard United States 4 x 8 x 4	.	.	.	4-8-4	3.02	.50	.79	4.31	7.97	2.26	1.85
2	Standard United States 4 x 8 x 4	.	.	.	4-8-4	2.90	.32	.84	4.06	8.03	2.18	1.85
3	Standard United States 5 x 8 x 7	.	.	.	5-8-7	3.78	.58	.98	5.34	8.25	6.28	.91
3	Standard United States 5 x 8 x 7	.	.	.	5-8-7	3.84	.45	.87	5.16	8.10	5.50	1.42
1	Standard United States 7 x 11 x 10	.	.	.	7-11-10	6.28	.22	.58	7.08	10.39	10.29	-
<b>Stimuplant Laboratories, Inc.</b>												
1	Stim-Up-Plant 11-12-15 Tablets	.	.	.	11-12-15	2.32	7.74	.28	10.34	14.80	-	17.61
<b>Swift &amp; Co., Fertilizer Works</b>												
1	Swift's Special Golf Fertilizer 12-6-4	.	.	.	12-6-4	10.96	1.26	.10	12.32	7.00	4.44	-
5	Vigoro 4-12-4	.	.	.	4-12-4	3.18	.40	.43	4.01	12.16	4.30	-
<b>F. Sylvester &amp; Son</b>												
1	Dove Brand Fertilizer 4-6-3	.	.	.	4-6-3	2.58	.35	1.91	4.84	6.06	3.84	-
<b>Synthetic Nitrogen Products Corp.</b>												
2	Nitrophoska 15-30-15	.	.	.	15-30-15	12.44	2.71	.43	15.58	30.61	15.04	-
1	Nitrophoska 15-30-15	.	.	.	15-30-15	12.36	2.34	.48	15.18	29.22	15.26	-
<b>Tennessee Corp.</b>												
4	Loma (5-10-4)	.	.	.	5-10-4	4.38	.48	.34	5.20	10.20	4.07	-
2	Loma (5-10-4)	.	.	.	5-10-4	4.28	.63	.43	5.34	10.15	4.17	-

<sup>a</sup> The water insoluble organic nitrogen was of inferior quality.



## Mixtures Substantially Complying with Guarantees — Concluded.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	Guarantee: Nitrogen — Available Phosphoric Acid — Potash	NITROGEN FOUND.				POTASH (K <sub>2</sub> O) FOUND.	
			In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.	As Muriate.	In Forms Other than Muriate.
	<b>Tennessee Corp. — Concluded.</b>							
5	Soil-Prep (4-2-2) . . . . .	4-2-2	1.60	.44	2.35	4.39	2.25	-
2	Soil-Prep (4-2-2) . . . . .	4-2-2	1.48	none	2.55	4.03	2.02	-
	<b>Van Horne Chemical Co.</b>							
1	Van Horne's Lawn & Garden Grower 5-8-5 . . . . .	5-8-5	1.68	.14	2.87	4.69	5.14	-
	<b>Victory Fertilizer Corp.</b>							
2	Victory Lawn & Garden Fertilizer 4-8-4 . . . . .	4-8-4	3.38	none	1.24	4.62	4.26	-
1	Victory Putting Green Fertilizer 6-8-2 . . . . .	6-8-2	4.58	.30	1.32	6.20	2.83	-
	<b>Virginia-Carolina Chemical Corp., Baltimore, Md.</b>							
4	V-C Aroostook Potato Grower 5-8-7 . . . . .	5-8-7	4.70	.24	.49	5.43	7.25	-
1	V-C Owl Brand Fertilizer 2-12-4 . . . . .	2-12-4	1.64	.17	.39	2.20	4.03	-
1	V-C Super Thirty-Eight 8-16-14 . . . . .	8-16-14	7.30	.35	.50	8.15	14.13	-
2	V-C Tip Top Top Dresser 7-6-6 . . . . .	7-6-6	6.52	.22	.71	7.45	6.24	-
3	V-C XXXX Fish & Potash 4-8-5 . . . . .	4-8-5	3.08	.27	.90	4.25	5.12	-
	<b>Virginia-Carolina Chemical Corp., Richmond, Va.</b>							
2	BloomAid 5-10-4 . . . . .	5-10-4	2.42	.97	1.62	5.01	-	4.38
2	BloomAid, Tablet Form, 10-14-6 . . . . .	10-14-6	9.50	.29	.31	10.10	-	6.76
1	BloomAid (Liquid) (old stock) . . . . .	1.85-2.6-1.12	.94	1.17	-	2.11	-	1.34
2	V-C Fairway Fertilizer 8-6-5 . . . . .	8-6-5	4.56	.25	2.42	7.23	5.02	-

C. P. Washburn Co.												
2	"Made Right" Corn & Vegetable	4-8-4	.	.	.	4-8-4	2.46	.60	.90	3.96	7.90	4.17
3	"Made Right" Market Garden	5-8-7	.	.	.	5-8-7	3.60	.68	.94	5.22	8.04	6.81
1	"Made Right" Special Potato	4-8-10	.	.	.	4-8-10	2.36	.63	1.07	4.06	8.10	9.59
Worcester Rendering Co.												
5	Prosperity All Crops Fertilizer	4-8-4	.	.	.	4-8-4	2.56	.47	1.07	4.10	8.04	4.28
5	Prosperity Corn & Grain Fertilizer	2-10-2	.	.	.	2-10-2	1.40	.23	.72	2.35	9.44	2.35
6	Prosperity Market Garden Fertilizer	5-8-7	.	.	.	5-8-7	3.62	.62	.98	5.22	8.16	7.00
4	Prosperity Market Garden Fertilizer	5-8-7	.	.	.	5-8-7	3.82	.33	1.02	5.17	8.22	7.52
4	Prosperity Special Potato Fertilizer	4-8-10	.	.	.	4-8-10	2.84	.60	.98	4.42	8.16	10.20
4	Prosperity Superior Top Dressing	7-6-6	.	.	.	7-6-6	5.06	.95	1.05	7.06	6.51	6.16

## CHEMICALS AND RAW PRODUCTS

## Summary of Results of the Inspection of Fertilizer Samples and Raw Products.

MATERIAL.	Number of Samples Collected.	Number of Analyses Made.	Average Percentage of Nitrogen.	Average Percentage of Total Phosphoric Acid.	Average Percentage of Available Phosphoric Acid.	Average Percentage of Water Soluble Potash.	Average Selling Price Per Ton.	Average Commercial Valuation per Ton.	Cost of One Pound of Plant Food (Cents).
Nitrate of soda . . . . .	54	13	16.22	—	—	—	\$34.63	\$32.44	10.7 (nitrogen)
Nitrate of potash . . . . .	8	5	13.24	—	—	44.24	74.00	61.87	14.6 (nitrogen) 4.0 (potash)
Nitrate of lime . . . . .	4	1	14.82	—	—	—	35.00	29.64	11.8 (nitrogen)
Cal-Nitro . . . . .	3	1	16.24	—	—	—	33.60	26.80	10.34 (nitrogen)
Ammonium sulfate . . . . .	53	18	20.77	—	—	—	32.73	27.00	7.9 (nitrogen)
Synthetic urea . . . . .	4	2	46.24	—	—	—	100.60	99.42	10.9 (nitrogen)
Cyanamid (a) . . . . .	10	2	22.23	—	—	—	36.43	26.68	8.2 (nitrogen)
Ammo-Phos A . . . . .	3	1	11.26	48.48	48.16	—	59.77	58.11	6.5 (nitrogen) 4.7 (available phosphoric acid)
Ammo-Phos B . . . . .	1	1	16.74	21.69	21.12	—	—	41.00	—
Cottonseed meal . . . . .	50	50	6.79	2.58	—	1.81 <sup>b</sup>	23.77	23.09	17.5 (nitrogen)
Linseed meal . . . . .	1	1	5.61	1.91	—	1.24 <sup>b</sup>	—	19.07	—
Castor pomace . . . . .	12	12	5.30	1.77	—	1.02 <sup>b</sup>	28.34	18.02	26.7 (nitrogen)
Dried blood . . . . .	5	4	11.37	1.65	—	—	40.69	30.96	17.3 (nitrogen)
Milorganite . . . . .	5	1	5.70	2.68 <sup>c</sup>	—	.48 <sup>b</sup>	26.16	15.49	21.0 (nitrogen)
Superphosphate 16% . . . . .	84	22	—	17.52	16.61	—	17.83	15.31	5.37 (available phosphoric acid)
Double Superphosphate . . . . .	4	1	—	32.53	32.53	—	32.20	29.28	4.95 (available phosphoric acid)
Precipitated bone . . . . .	3	3	—	41.73	40.76	—	41.32	37.07	5.1 (available phosphoric acid)
Basic slag phosphate . . . . .	2	1	—	17.86	14.61	—	23.47	14.45	8.0 (available phosphoric acid)
Muriate of potash . . . . .	40	9	—	—	—	51.70	48.29	45.50	4.7 (potash)
High grade sulfate of potash . . . . .	15	6	—	—	—	49.78 <sup>d</sup>	55.43	58.74	5.6 (potash)
Potash-magnesia sulfate . . . . .	2	2	—	—	—	28.10 <sup>e</sup>	30.00	33.16	5.3 (potash)
Dry ground fish . . . . .	25	11	9.52	7.43 <sup>f</sup>	—	—	51.11	44.77	23.3 (nitrogen)
Animal tankage . . . . .	40	15	9.90	7.97 <sup>g</sup>	—	—	35.12	28.91	14.3 (nitrogen)
Garbage tankage . . . . .	3	3	2.68	2.81	—	2.10 <sup>b</sup>	—	8.25	—
Ground bone . . . . .	83	33	3.04	24.17 <sup>h</sup>	—	—	40.22	28.42	—
Wood ashes . . . . .	3	3	—	1.74 <sup>i</sup>	—	4.24 <sup>b</sup>	—	9.27	—
Ground tobacco stems . . . . .	2	2	1.77	.59 <sup>j</sup>	—	3.92 <sup>b</sup>	19.00	10.25	—
Pulverized sheep manure (k) . . . . .	47	14	1.72	1.26	—	3.20 <sup>b</sup>	41.69	6.67	—
Pulverized goat manure (k) . . . . .	2	2	1.15	.77	—	3.74 <sup>b</sup>	—	5.68	—
Pulverized cattle manure (k) . . . . .	10	6	1.85	1.10	—	1.82 <sup>b</sup>	47.96	5.67	—
Pulverized poultry manure (k) . . . . .	5	1	5.27	2.39	—	1.05 <sup>b</sup>	50.00	12.24	—
Pulverized manure and peat (k) . . . . .	4	1	3.05	3.29	—	1.50 <sup>b</sup>	50.00	9.36	—
Pulverized manure and peanut shells (k) . . . . .	1	1	1.95	1.66	—	2.37 <sup>b</sup>	—	6.74	—
Sheep manure and wool waste (k) . . . . .	4	2	2.11	.59	—	5.29 <sup>h</sup>	17.48	8.50	—
Pulverized sheep and goat manure (k) . . . . .	24	9	1.50	1.11	—	3.47 <sup>b</sup>	42.23	6.37	—

a Also contains 50.77% calcium oxide.

b Total potash.

c Iron and aluminum oxides 9.28%, calcium oxide 1.89%, magnesium oxide 1.38%, insoluble matter 11.36%.

d Chlorine 2.10%.

e Magnesium oxide 9.71%, chlorine 1.54%.

f Chlorine .35%.

g Average tankage finer than 1/50 inch, 48.65%; coarser than 1/50 inch, 51.35%.

h Average bone finer than 1/50 inch, 70.18%; coarser than 1/50 inch, 29.82%.

i Average calcium oxide 33.32%, magnesium oxide 4.08%, insoluble matter 14.55%.

j Average organic matter 55.34%, calcium oxide 10.49%, magnesium oxide 1.59%, chlorine 1.52%.

k Average organic matter: sheep manure, 48.45%; cow manure and peanut hulls, 78.15%; goat manure, 34.00%; poultry manure, 68.62%; peat-poultry manure, 68.15%; sheep manure-wool waste, 43.10%; cattle manure, 73.57%; pulverized sheep and goat manure, 37.72%.

## Nitrogen Compounds.

The chemicals and unmixed materials under this heading are valued chiefly for the nitrogen which they contain. Some of them, however, contain more than this one element: the nitrate of potash containing potash; the calcium nitrate and cyanamid containing lime; and the organic vegetable substances containing small quantities of phosphoric acid and potash, as will be noticed by a reference to the summary table on the previous page.

Brands showing a commercial shortage of one dollar or more per ton follow the appropriate table, but are listed by themselves, serious deficiencies therein being emphasized by boldface type.

## Nitrate of Soda and Sulfate of Ammonia.

MANUFACTURER.	NITRATE OF SODA.			SULFATE OF AMMONIA.		
	Number of Samples.	NITROGEN.		Number of Samples.	NITROGEN.	
		Found.	Guaranteed.		Found.	Guaranteed.
American Agricultural Chemical Co.	<div>1 14 3 1</div>	<div>16.06 16.44 16.00 15.94</div>	<div>16.00 16.00 16.00 15.25</div>	<div>1 12 8</div>	<div>20.92 20.74 20.88</div>	<div>20.70 20.70 20.56</div>
Apothecaries Hall Co. . . . .	1	15.50	14.81	1	20.74	20.50
Armour Fertilizer Works . . . .	7	16.08	16.00	4	20.84	20.56
Barrett Co. . . . .	<div>4 1</div>	<div>16.12 15.60</div>	<div>16.00 14.80</div>	<div>1 1</div>	<div>20.68 20.90</div>	<div>20.56 20.56</div>
Berkshire Chemical Co. . . . .	1	15.60	14.80			
Chilean Nitrate Sales Corp. . . .	<div>6a 4a 5b</div>	<div>16.02 16.04 15.66</div>	<div>16.00 16.00 15.25</div>			
Consolidated Rendering Co. . . .				<div>4 2 2 2 5 2 4 2 1</div>	<div>20.66 21.00 20.88 20.88 20.76 20.40 20.88 20.86 20.88</div>	<div>20.50 20.50 20.50 20.80 20.56 20.56 20.75 20.75 20.75</div>
Eastern States Farmers' Exchange .						
Ford Motor Co. . . . .						
International Agricultural Corp. .						
Koppers Products Co. . . . .						
Merrimac Chemical Co. . . . .	6	16.26	16.25			
Old Deerfield Fertilizer Co., Inc. .				1	20.80	20.50
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	1	15.64	16.00			

a Champion brand.

b Standard brand.

## Calcium Nitrate, Cal-Nitro, Urea and Calcium Cyanamid.

MANUFACTURER.	BRAND.	Number of Samples.	NITROGEN.	
			Found.	Guaranteed.
American Cyanamid Co. . . . .	<div>Aero Cyanamid . . . . Aero Cyanamid . . . .</div>	<div>4 6</div>	<div>22.44 22.12</div>	<div>22.00 22.00</div>
Eastern States Farmers' Exchange .	Urea . . . . .	2	46.24	46.00
Synthetic Nitrogen Products Corp. .	<div>Calcium Nitrate . . . . Cal-Nitro . . . . .</div>	<div>4 3</div>	<div>14.82 16.24</div>	<div>15.00 16.00</div>
	Urea (Floranid-Urea) . . . .	2	46.18	46.00
Foodndrink Co. . . . .	Foodndrink (a) . . . .	1	16.04	13.00

a Urea in cartridge form for hose attachment.

## Nitrate of Potash.

MANUFACTURER.	Number of Samples.	NITROGEN.		POTASSIUM OXIDE.		Chlorine.
		Found.	Guaranteed.	Found.	Guaranteed.	
Consolidated Rendering Co. . . . .	1	13.08	13.00	44.52	44.00	.84
Eastern States Farmers' Exchange . . . . .	4	13.24	13.00	44.30	44.00	2.71
International Agricultural Corp. . . . .	1	13.38	13.00	44.18	44.00	.89
Old Deerfield Fertilizer Co., Inc. . . . .	1	13.10	13.00	44.00	44.00	.90
	1	13.16	13.00	44.50	44.00	.72

## Cottonseed Meal and Castor Pomace.

MANUFACTURER.	COTTONSEED MEAL.			CASTOR POMACE.		
	Number of Analyses.	NITROGEN.		Number of Analyses.	NITROGEN.	
		Found.	Guaranteed.		Found.	Guaranteed.
American Agricultural Chemical Co. . . . .				2	5.16	4.53
Apothecaries Hall Co. . . . .				1	6.07	4.52
Armour Fertilizer Works . . . . .				2	4.89	4.52
Ashcraft-Wilkinson Co. . . . .	11	6.71	6.56			
	1	7.02	6.88			
Baker Castor Oil Co. . . . .				2	5.96	4.50
Berkshire Chemical Co. . . . .				3	5.08	4.52
Buckeye Cotton Oil Co. . . . .	1	6.68	6.56			
Cairo Meal and Cake Co. . . . .	2	6.45	6.58			
Consolidated Rendering Co. . . . .				2	5.19	4.52
Humphreys-Godwin Co. . . . .	6	7.00	6.87			
	26	6.74	6.56			
L. B. Lovitt & Co. . . . .	1	6.68	6.56			
Maurice Pincoffs Co. . . . .	2	6.79	6.56			

## Old Process Linseed Meal, Dried Blood, Milorganite, and Nitrogen Fertilizer

MANUFACTURER.	BRAND.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.	
			Found.	Guaranteed.	Found.	Guaranteed.
Apothecaries Hall Co. . . . .	Old Process Linseed Meal . . . . .	1	5.61	5.44	1.91	—
Milwaukee Sewerage Commission . . . . .	Milorganite . . . . .	5	5.70	5.00	2.68	2.75
New England Dressed Meat & Wool Co. . . . .	Dried Blood . . . . .	1	12.39	11.93	.27	—
New England Rendering Co. . . . .	Dried Blood . . . . .	2	12.18	11.51	1.79	—
John Reardon & Sons Co. . . . .	Dried Blood . . . . .	1	11.18	12.34	2.70	—
Charles T. Rouleau . . . . .	Nitrogen Fertilizer . . . . .	1	16.88	15.00	—	—

## Brand Showing Commercial Shortage of More than \$1 Per Ton

John Reardon & Sons Co. . . . .	Dried Blood . . . . .	1a	9.00	12.34	3.83	—
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a Commercial shortage per ton, \$5.23.

## Commercial Peat Products.

MANUFACTURER OR IMPORTER.	BRAND.	Water.	Organic Matter.	Mineral Matter.	NITROGEN.	
					Found.	Guaranteed.
Atkins & Durbrow, Inc.	{ Granulated Peat Moss	12.18	81.07	6.75	.87	.24
	{ Sorbex (Ground Peat Moss) (a)	19.15	78.32	2.53	.90	.24
Brague, Inc. . . . .	Hinsdale Peat (b)	65.42	32.28	2.30	.37	.50
C. E. Buell, Inc. . . .	Buell-Boston Ground Peat	12.47	85.60	1.93	.99	.75
Curley Brothers . . .	Crystal Peat Moss	11.39	87.06	1.55	1.34	.50
Maplevale Leafmold Co.	Maplevale Leaf Mold	50.27	44.60	5.13	.77	.25
Victory Fertilizer Corp.	Victory Humus	48.90	20.64	30.46	.70	.50

a Five samples.

b The mineral constituents present included iron and aluminum oxides .16%, calcium oxide .11%, magnesium oxide .08%, insoluble earthy material 1.69%.

## Phosphoric Acid Compounds.

The following table gives the analyses of those fertilizer products valued chiefly for their available phosphoric acid.

## Superphosphate, Precipitated Bone and Basic Slag Phosphate.

MANUFACTURER.	BRAND.	Number of Samples.	Total Phosphoric Acid.	AVAILABLE PHOSPHORIC ACID.	
				Found.	Guaranteed.
American Agricultural Chemical Co. . . . .	{ A A 16% Superphosphate	1	17.42	17.25	16.00
	{ A A 16% Superphosphate	14	17.60	16.30	16.00
	{ A A 16% Superphosphate	9	17.22	16.58	16.00
	{ Co-Op 16% Superphosphate	5	17.35	16.65	16.00
Apothecaries Hall Co. . .	{ Superphosphate . . . .	3	17.60	16.90	16.00
	{ Precipitated Bone . . . .	1	42.10	40.06	36.00
Armour Fertilizer Works .	16% Superphosphate . . .	3	16.71	16.39	16.00
Berkshire Chemical Co. .	Berkshire Superphosphate	2	17.35	16.84	16.00
Consolidated Rendering Co.	{ 16% Superphosphate . . .	6	17.48	16.97	16.00
	{ 16% Superphosphate . . .	6	17.35	16.58	16.00
	{ 20% Superphosphate . . .	1	19.45	18.75	20.00
	{ 16% Superphosphate . . .	6	17.48	16.97	16.00
Eastern States Farmers' Exchange . . . . .	{ 16% Superphosphate . . .	5	17.73	17.09	16.00
	{ 32% Superphosphate . . .	4	32.53	32.53	32.00
	{ Precipitated Bone . . . .	1	41.45	40.68	38.50
	{ 16% Superphosphate . . .	6	17.22	16.71	16.00
International Agricultural Corp. . . . .	{ 16% Superphosphate . . .	1	17.48	17.25	16.00
	{ 16% Superphosphate . . .	2	17.09	16.64	16.00
	{ Genuine Imported Basic Slag	2	17.86	14.61	14.40
	{ Imported Ground Basic Slag	1	7.91	7.64	8.00
Old Deerfield Fertilizer Co., Inc.	{ 16% Superphosphate . . .	1	17.86	17.48	16.00
Piedmont-Mt. Airy Guano Co., Inc. . . . .	{ Precipitated Bone . . . .	1	44.75	43.98	38.00
Rogers & Hubbard Co. . .	{ Harvest Brand 16% Superphosphate	1	16.97	16.27	16.00
	{ Hubbard's Superphosphate	6	17.35	16.65	16.00
	{ Hubbard's Superphosphate	2	17.22	16.71	16.00
Standard Wholesale Phosphate & Acid Works, Inc.	Standard United States 16% Superphosphate . . . .	2	17.09	16.07	16.00
Virginia-Carolina Chemical Corp. . . . .	V-C 16% Superphosphate	1	18.75	16.33	16.00
C. P. Washburn Co. . . .	Superphosphate 16% . .	1	16.84	16.27	16.00

### Potash Compounds.

The tables under this heading give the composition of those fertilizer products valued chiefly for their potash.

#### Muriate and High Grade Sulfate of Potash.

MANUFACTURER.	MURIATE OF POTASH.			HIGH GRADE SULFATE OF POTASH.			
	Number of Samples.	POTASH.		Number of Samples.	POTASH.		Chlorine.
		Found.	Guaranteed.		Found.	Guaranteed.	
American Agricultural Chemical Co. . . . .	1	51.96	51.80	1	49.76	48.00	2.24
	13	51.84	51.80	2	49.28	48.00	2.18
	1	50.70	50.00	3	49.81	48.00	2.35
	5	50.00	50.00				
Consolidated Rendering Co. . .	3	50.04	50.00				
Eastern States Farmers' Exchange	3	51.98	50.00	1	50.16	48.00	2.35
International Agricultural Corp.	4	50.66	48.00				
N. V. Potash Export My., Inc.	6	50.28	48.00	5	49.92	48.00	1.88
	4	50.74	48.00	2	50.74	48.00	2.06

#### Sulfate of Potash-Magnesia.

MANUFACTURER.	Number of Samples.	POTASH.		Magnesium Oxide	Chlorine.
		Found.	Guaranteed.		
N. V. Potash Export My., Inc. . . . .	1	27.44	25.00	9.63	2.10
	1	28.76	25.00	9.78	.98

### Products Supplying Nitrogen and Phosphoric Acid.

#### Dry Ground Fish.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		Chlorine.
		Found.	Guaranteed.	Found.	Guaranteed.	
American Agricultural Chemical Co.	3	9.21	9.00	8.16	6.00	.47
Apothecaries Hall Co. . . . .	2	9.52	8.22	6.63	5.00	1.03
Armour Fertilizer Works . . . .	1	9.02	9.00	8.42	4.00	.16
Berkshire Chemical Co. . . . .	2	9.32	9.04	6.07	6.00	trace
	5	9.61	9.04	6.38	6.00	.20
Consolidated Rendering Co. . . .	1	9.82	8.22	8.55	6.40	.18
Eastern States Farmers' Exchange	1	9.23	9.00	6.63	6.00	.19
International Agricultural Corp. .	2	10.17	10.50	5.36	4.50	2.85
Old Deerfield Fertilizer Co., Inc. .	2	9.41	9.05	7.40	5.00	.50
Olds & Whipple, Inc. . . . .	2	10.30	9.00	6.12	5.00	.21
Rogers & Hubbard Co. . . . .	4	9.87	9.00	7.27	5.00	1.06

## Animal Tankage.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
American Agricultural Chemical Co. . . . .	{ 1	10.40	10.00	7.81	7.41	47.93	52.07
	{ 13	10.20	10.00	7.60	7.41	52.81	47.19
	{ 2	7.33	7.40	11.35	9.15	50.60	49.40
Armour Fertilizer Works . . .	{ 1	7.74	7.00	4.46	3.00	49.81	50.19
Consolidated Rendering Co. . .	{ 3	8.01	6.00	9.57	7.25	53.26	46.74
	{ 5	7.97	7.41	9.69	9.15	46.46	53.54
	{ 2	7.43	7.41	8.64	9.15	60.84	39.16
Eastern States Farmers' Exchange	1	7.72	7.50	11.35	9.00	34.30	65.70
International Agricultural Corp.	2	7.49	7.40	8.42	9.15	53.31	46.69
Old Deerfield Fertilizer Co., Inc.	1	9.71	9.00	8.67	5.00	28.61	71.39
John Reardon & Sons Co. . . .	1	7.10	5.00	14.03	10.00	65.80	34.20
Rogers & Hubbard Co. . . . .	3	7.73	7.40	9.82	9.15	58.03	41.97
N. Roy & Son . . . . .	1	7.53	7.00	12.25	8.00	61.22	38.78
Springfield Rendering Co. . . .	3	10.03	9.00	8.29	8.00	28.68	71.32
Woodard Bros. . . . .	1	4.35	4.50	22.96	18.00	43.28	56.72

## Ground Bone.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
American Agricultural Chemical Co. . . . .	{ 6	2.63	2.47	23.28	23.00	74.83	25.17
	{ 2	2.69	2.47	24.24	23.00	75.69	24.31
Apothecaries Hall Co. . . . .	2	4.35	3.29	20.21	20.00	79.65	20.35
Armour Fertilizer Works . . . .	{ 5	3.09	2.47	23.60	22.00	76.56	23.44
	{ 1	3.18	2.47	23.92	22.00	72.84	27.16
	{ 1	3.17	2.47	23.60	22.00	79.25	20.75
Associated Chemical Co. . . . .	1	2.77	2.47	23.60	23.00	80.05	19.95
Berkshire Chemical Co. . . . .	2	2.66	2.47	22.96	20.00	67.25	32.75
Joseph Breck & Sons Corp. . . .	3	3.14	2.47	23.28	22.50	64.13	35.87
Consolidated Rendering Co. . . .	{ 6	2.88	2.05	23.60	22.90	63.27	36.73
	{ 3	2.70	2.05	24.56	22.90	70.97	29.03
	{ 3	3.06	2.05	24.56	22.90	74.79	25.21
Consumers Import Co., Inc. . . .	1	2.88	2.40	20.86	22.75	80.06	19.94
Eastern States Farmers' Exchange	3	3.16	2.50	23.98	23.00	70.12	29.88
Goulard & Olena, Inc. . . . .	4	2.95	2.40	24.56	22.75	72.92	27.08
International Agricultural Corp. . .	4	2.56	2.47	24.87	22.00	83.13	16.87
New England Rendering Co. . . .	3	2.56	2.08	25.51	25.17	74.76	25.24
Old Deerfield Fertilizer Co., Inc.	1	2.82	2.47	28.83	22.00	75.37	24.63
Olds & Whipple, Inc. . . . .	1	2.76	2.47	25.51	22.88	82.83	17.17
Carroll S. Page Co., Inc. . . . .	1	4.16	3.70	22.96	22.00	30.30	69.70
Pawtucket Rendering Co. . . . .	{ 2	3.39	2.05	23.60	22.00	51.05	48.95
	{ 2	3.64	2.05	23.60	22.00	49.68	50.32
John Reardon & Sons Co. . . . .	5	3.90	2.47	22.96	22.88	71.50	28.50
Rogers & Hubbard Co. . . . .	{ 1	3.88	3.82	26.40	24.70	94.47	5.53
	{ 2	3.89	3.29	24.87	22.50	46.21	53.79
	{ 2	3.02	2.47	23.60	22.85	83.42	16.58
N. Roy & Son . . . . .	5	2.35	2.50	26.47	24.00	63.32	36.68
F. Rynveld & Sons . . . . .	2	2.94	1.85	24.24	22.88	71.37	28.63
Van Horne Chemical Co. . . . .	1	2.57	2.40	24.87	22.75	80.05	19.95
Van Iderstine Co. . . . .	{ 1	2.60	2.00	29.08	29.00	71.05	28.95
	{ 1	1.95	2.00	28.70	29.00	71.05	28.95
Virginia-Carolina Chemical Corp. . . . .	2	2.45	2.45	23.28	22.00	82.25	17.75
C. P. Washburn Co. . . . .	1	4.03	2.50	22.39	23.00	78.63	21.37



## Ammo-Phos.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		
		Found.	Guaranteed.	Total.	AVAILABLE.	
					Found.	Guaranteed.
American Cyanamid Co. . . . .	{ 3 1	11.26	11.00	48.48	48.16	48.00
		16.74	16.00	21.69	21.12	20.00

## Miscellaneous.

## Garbage Tankage

MANUFACTURER AND BRAND.	TOTAL NITROGEN.		PHOSPHORIC ACID.		TOTAL POTASH.		MECHANICAL FINENESS.	
	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
<b>American Reduction Corp.</b> Soil Aid (Bacterized Garbage Tankage) (a) . . . . .	2.60	1.90	3.70	1.30	2.10	.30	55.70	44.30
<b>Cobwell Reduction Co.</b> Natural Fertilizer (Garbage Tankage) (b) . . . . .	2.93	2.67	2.88	1.83	1.26	.60	65.40	34.60
Natural Fertilizer (Garbage Tankage) . . . . .	2.50	2.67	1.84	1.83	1.05	.60	—	—

(a) There was found: ammoniacal nitrogen .22%, water soluble organic nitrogen .67%, and water insoluble organic nitrogen 1.71%. The activity of the latter was 25% by the alkaline, and 68.6% by the neutral permanganate method.

(b) The nitrogen in this product showed no ammoniacal or nitrate nitrogen, .53% water soluble organic and 2.40% water insoluble organic nitrogen. The activity of the latter was 28.20% by the alkaline, and 69.6% by the neutral permanganate method.

## Ground Tobacco Stems.

MANUFACTURER AND BRAND.	Moisture.	NITROGEN.		PHOSPHORIC ACID.		POTASH.		Chlorine.
		Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	
<b>Tobacco By-Products &amp; Chemical Corp.</b> Black Leaf Tobacco Stem Meal (a) . . . . .	7.33	1.16	1.16	.77	.50	4.42	4.00	1.54
<b>Uniform Products Co., Inc.</b> F. & I. Ground Tobacco Stems (b) . . . . .	11.32	2.68	1.75	.33	.25	3.18	3.50	1.48

a Also contained organic matter 46.75%, calcium oxide 13.31%, magnesium oxide 1.23%.

b Also contained organic matter 68.23%, calcium oxide 6.26%, magnesium oxide 2.14%.

## Wood Ashes.

MANUFACTURER.	Moisture.	PHOSPHORIC ACID.		POTASSIUM OXIDE.		Cal- cium Oxide.	Magne- sium Oxide.	Insoluble Matter.
		Found.	Guaran- teed.	Found.	Guaran- teed.			
John Joynt . . .	12.28	1.72	1.00	4.15	3.00	32.88	4.04	14.87
	2.54	1.85	1.00	4.94	3.00	37.84	4.50	12.00
	11.99	1.91	1.00	4.83	3.00	34.68	4.18	12.40

## Pulverized Animal Manures.

MANUFACTURER AND BRAND.	Number of Samples.	TOTAL NITROGEN.		TOTAL PHOSPHORIC ACID.		TOTAL POTASH.		Organic Matter.	Moisture.
		Found.	Guaran- teed.	Found.	Guaran- teed.	Found.	Guaran- teed.		
<b>American Agricultural Chemical Co.</b>									
Pulverized Sheep & Goat Manure . . .	6	1.53	1.23	1.15	1.00	3.60	2.00	37.03	17.58
Pulverized Sheep & Goat Manure . . .	3	1.51	1.23	1.02	1.00	3.24	2.00	36.52	23.17
<b>Apothecaries Hall Co.</b>									
Sheep Manure . . .	2	1.91	2.00	1.98	1.00	4.09	2.00	64.99	5.81
<b>Armour Fertilizer Works</b>									
Sheep and Goat Manure . . .	4	1.37	1.25	1.34	1.00	3.62	2.00	36.75	13.41
<b>Joseph Breck &amp; Sons Corp.</b>									
Rams Head Brand Sheep Manure . . .	4	1.51	1.46	.77	.75	3.37	3.00	39.17	10.97
<b>C. E. Buell, Inc.</b>									
Two-In-One Peat-Poultry Manure . . .	2	3.11	3.00	3.13	3.25	1.50	1.50	68.63	11.65
Two-In-One Peat-Poultry Manure . . .	2	3.00	2.75	3.44	2.50	1.60	1.25	67.67	10.29
<b>Consolidated Rendering Co.</b>									
Corenco Sheep Manure . . .	6	1.45	1.23	.96	.50	3.05	2.00	36.20	12.34
Corenco Sheep Manure . . .	6	1.59	1.23	1.28	.50	3.17	2.00	34.88	13.87
<b>Rowland T. Cresse</b>									
Sheep and Goat Manure . . .	3	1.55	1.30	1.15	.80	3.44	2.75	38.51	15.09
Sheep and Goat Manure . . .	1	1.59	1.30	1.08	.80	3.84	2.75	44.25	14.10
<b>Dairies By-Products Co.</b>									
Mo-Co-Nu . . .	1	1.73	1.50	1.28	1.00	1.72	1.25	64.39	5.55
<b>Davey Tree Expert Co.</b>									
Shredded Cattle Manure . . .	1	1.75	1.00	1.05	1.00	2.36	2.00	68.46	10.85
<b>Dutton Sales Co.</b>									
Cal-Test Sheep Manure . . .	5	1.55	1.50	1.33	1.00	2.34	2.00	39.41	12.98
<b>Eastern States Farmers' Exchange</b>									
Eastern States Goat Manure . . .	2	1.48	1.00	.70	.50	2.81	2.00	38.56	6.30
<b>Thomas W. Emerson Co.</b>									
Venezuelan Goat Manure . . .	1	1.15	1.25	.77	.50	3.74	2.00	34.00	7.10
<b>Emporia Elevator &amp; Feeding Co.</b>									
Big Sheep Pulverized Sheep Manure . . .	1	2.09	2.00	2.04	1.00	4.21	2.00	74.18	6.63
<b>Goulard &amp; Olena, Inc.</b>									
G. & O. Sheep Manure . . .	3	1.41	1.50	1.15	1.50	2.99	2.00	34.00	13.64
<b>Heil Co.</b>									
Quality Dehydrated Sheep Manure . . .	1	2.02	2.00	2.10	1.50	4.33	2.00	73.17	6.22
<b>International Agricultural Corp.</b>									
International Caribbee Sheep Manure . . .	7	1.62	1.02	1.28	.50	3.57	2.00	37.08	19.46
<b>Natural Guano Co.</b>									
Sheep's Head Pulverized Sheep Manure . . .	5	2.03	2.00	1.21	1.00	3.11	2.00	74.27	7.51

Pulverized Animal Manures — *Continued*

MANUFACTURER AND BRAND.	Number of Samples.	TOTAL NITROGEN.		TOTAL PHOSPHORIC ACID.		TOTAL POTASH.		Organic Matter.	Moisture.
		Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
<b>Premier Poultry Manure Co.</b>									
Shredded Cattle Manure	1	2.05	1.65	1.15	.85	2.87	2.00	50.83	6.43
Pulverized Poultry Manure	5	5.27	4.93	2.39	2.60	1.05	1.30	68.62	9.72
Pulverized Sheep Manure	1	3.37	2.46	3.44	1.50	2.15	2.00	62.11	6.17
<b>Pulverized Manure Co.</b>									
Wizard Brand Cattle Manure	1	2.18	2.00	1.34	1.00	1.27	1.00	70.68	5.35
Wizard Brand Sheep Manure	3	2.08	2.00	1.66	1.00	3.63	2.00	67.01	6.76
<b>Ramshorn Mills</b>									
Sheep Manure & Wool Waste	3	1.91	1.50	.70	.60	5.35	3.75	42.30	7.37
<b>Rogers &amp; Hubbard Co.</b>									
Sheep and Goat Manure	4	1.49	1.35	.89	.75	3.98	3.75	38.01	11.94
Sheep and Goat Manure	1	1.55	1.35	1.91	.75	3.02	3.75	33.71	21.93
<b>Summers Fertilizer Co.</b>									
Venezuelan Goat Manure	1	1.43	.82	1.21	1.00	3.28	3.00	40.03	4.44
<b>Van Horne Chemical Co.</b>									
Van Horne's Sheep Manure	1	1.76	1.50	1.15	1.50	4.10	2.00	38.03	7.40
<b>Virginia-Carolina Chemical Corp.</b>									
Sheep Manure	2	2.06	1.65	1.91	.75	4.83	1.50	65.48	6.55
<b>Walker-Gordon Farms</b>									
Driconure	5	1.93	1.00	1.02	1.00	1.49	1.00	80.71	6.86
<b>Walker-Gordon Laboratory Co., Inc.</b>									
Bovung	1	1.94	2.00	1.84	2.00	2.06	2.00	77.60	6.85
Bovung	1	1.95	2.00	1.66	2.00	2.37	2.00	78.15	8.22
<b>W. W. Windle Co.</b>									
Sheep Manure Dusted from Wool	1	2.16	2.44	.56	.92	5.27	4.92	43.30	8.15

Note: The sum of the organic matter and moisture, subtracted from 100, gives the mineral matter, which is largely inert, earthy material.

## Stone Meal.

PLANT FOOD ELEMENTS.	MANUFACTURED BY MENDERTH, INC.			MANUFACTURED BY DONALD S. MCCRILLIS.		
	Guaranteed.	Found.		Guaranteed.	Found.	
		Soluble in Dilute Hydrochloric Acid.	By Fusion Method.		Soluble in Dilute Hydrochloric Acid.	By Fusion Method.
Potassium oxide . . . .	3.00	1.34	3.41	3.00	.12	1.05
Calcium oxide . . . .	3.00	1.89	2.80	.56	2.35	4.70
Magnesium oxide . . . .	2.00	2.32	3.19	2.00	2.64	4.13
Phosphoric acid . . . .	.13	.19	.26	.25	.26	.38

No water soluble potash was found or guaranteed in either product.

Occasional inquiries come to us regarding the value, both commercial and agricultural, of these two Stone Meals. Obviously, both the commercial and agricultural value of any material as a fertilizer must depend largely upon the amount of available plant food which the product supplies. The chemical analysis of metamorphic rocks shows the presence of several substances which make up the greater bulk of such rocks but which can have only a very limited intrinsic or agricultural value; in fact, soils themselves are made up largely of

these constituents. The only elements which the Stone Meals furnish which may have a slight fertilizing value on Massachusetts soils are potash, calcium oxide, magnesium oxide, and phosphoric acid; but the agricultural value of even these four constituents from this source is open to the gravest doubts for the reason that they are present largely as silicates and therefore but very slowly soluble in soil solution. Wolling finds that the average soil at a depth of 1.5 meters (4.92 feet) contains from 3.84 to 14.6% of carbon dioxide; yet even the larger amount would have much less dissolving effect than strong hydrochloric acid diluted with an equal volume of water (this gives a strength of 22.86% hydrochloric acid), which was used in continuous digestion for ten hours at a temperature of boiling water in making a part of the analyses reported above. Assuming, therefore, that the amounts of the four plant food constituents dissolved by the 1-1 hydrochloric acid represent the maximum that would become of value during a reasonable length of time (say five to ten years), the highest value that could be given to these Stone Meals would be \$1.72 per ton for Menderth and 90 cents per ton for McCrillis Stone Meal.

#### DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZER FOR SALE IN MASSACHUSETTS IN 1933.

Acme Guano Co., 311 Marine Bank Bldg., Baltimore, Md.  
 American Agricultural Chemical Co., 285 River St., North Weymouth, Mass.  
 American Cyanamid Co., 535 Fifth Ave., New York, N. Y.  
 American Reduction Corp., Suite 2041, 105 West Adams St., Chicago, Ill.  
 American Soda Products Co., 121 East Oak Ave., Moorestown, N. J.  
 Apothecaries Hall Co., 8-24 Benedict St., Waterbury, Conn.  
 Armour Fertilizer Works, 10 East 40th St., New York, N. Y.  
 Ashcraft-Wilkinson Co., Atlanta, Ga.  
 Associated Chemical Co., Hagerstown, Md.  
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.  
 Baker Castor Oil Company of Delaware, 120 Broadway, New York, N. Y.  
 Barrett Co., 40 Rector St., New York, N. Y.  
 Barrie Laboratories, Inc., 84 State St., Boston, Mass.  
 F. A. Bartlett Tree Expert Co., Inc., 60 Canal St., Stamford, Conn.  
 Berkshire Chemical Co., Bridgeport, Conn.  
 Brague, Inc., South & Maple St., Hinsdale, Mass.  
 Joseph Breck & Sons Corp., 85 State St., Boston, Mass.  
 Buckeye Cotton Oil Co., Cincinnati, Ohio.  
 C. E. Buell, Inc., 6 Beacon St., Boston, Mass.  
 Cairo Meal and Cake Co., 46th St. and Sycamore, Cairo, Ill.  
 Chilean Nitrate Sales Corp., 120 Broadway, New York, N. Y.  
 Clay & Son, Ltd., Temple Mill Lane, Stratford, London, England.  
 Cobwell Reduction Co., Inc., P. O. Box 1081, Syracuse, N. Y.  
 Collins Seed Service Co., 131 Beverly St., Boston, Mass.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Consumers Import Co., Inc., 115 Broad St., New York, N. Y.  
 Rowland T. Cresse, 127 Governors Ave., Medford, Mass.  
 Curley Brothers, Main St. & North Ave., Wakefield, Mass.  
 Daggett Chocolate Co., 408 Main St., Cambridge, Mass.  
 Dairies By-Products Co., 1109 Royster Bldg., Norfolk, Va.  
 Davey Tree Expert Co., Kent, Ohio.  
 Dutton Sales Co., 140 Front St., San Francisco, Cal.  
 Eastern States Farmers' Exchange, Box 1482, Springfield, Mass.  
 Thomas W. Emerson Co., 213-215 State St., Boston, Mass.  
 Emporia Elevator & Feeding Co., Emporia, Lyon County, Kan.  
 Essex Fertilizer Co., 178 Atlantic Ave., Boston, Mass.  
 Foodndrink Co., 24 Milk St., Boston, Mass.  
 Ford Motor Co., By-Product Sales Dept., 3674 Schaefer Road, Dearborn, Mich.  
 L. T. Frisbie Co., New Haven, Conn.  
 H. L. Frost & Co., 20 Mill St., Arlington, Mass.  
 Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.  
 T. J. Grey Co., 16 South Market St., Boston, Mass.  
 Heil Co., 3000 West Montana St., Milwaukee, Wis.  
 Thomas Hersom & Co., New Bedford, Mass.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 International Agricultural Corp., 38 Chauncy St., Boston, Mass.  
 John Joynt, Lucknow, Ontario, Canada.  
 Koppers Products Co., Koppers Bldg., Pittsburgh, Penn.  
 M. F. Lansill, 86 Charles River Parkway, Newton, Mass.  
 L. B. Lovitt & Co., 1004 Falls Bldg., Memphis, Tenn.  
 Lowell Fertilizer Co., 178 Atlantic Ave., Boston, Mass.  
 Maine Farmers Exchange, Inc., 708 Grain & Flour Exchange, Boston, Mass.  
 Maplevale Leafmold Co., East Kingston, N. H.  
 D. C. McCrillis, Stoney Brook (Weston), Mass.  
 Menderth, Inc., 126 State St., Boston, Mass.  
 Merrimac Chemical Co., Inc., Everett Station, Boston, Mass.  
 Miller Fertilizer Co., 1801 Baltimore Trust Bldg., Baltimore, Md.  
 Milwaukee Sewerage Commission, P. O. Box 2079, Milwaukee, Wis.

Natural Guano Co., Aurora, Ill.  
 New England Dressed Meat & Wool Co., 174 Somerville Ave., Somerville, Mass.  
 New England Fertilizer Co., 178 Atlantic Ave., Boston, Mass.  
 New England Rendering Co., Rear 39 Market St., Brighton, Mass.  
 Nitrate Agencies Co., 104 Pearl St., New York, N. Y.  
 N. V. Potash Export My., Inc., Baltimore Branch Office, 2404 Baltimore Trust Bldg., Baltimore, Md.  
 Old Deerfield Fertilizer Co., Inc., 28 Sugarloaf St., South Deerfield, Mass.  
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.  
 Pacific Manure & Fertilizer Co., 108-110 Davis St., San Francisco, Cal.  
 Carroll S. Page Co., Hyde Park, Vt.  
 Pawtucket Rendering Co., Rear 654 Mineral Spring Ave., Pawtucket, R. I.  
 Pedigreed Seed Co., Inc., 74 Reade St., New York, N. Y.  
 F. G. Phillips Co., 12 Circuit Road, Dedham, Mass.  
 Piedmont-Mt. Airy Guano Co., Inc., 1801 Baltimore Trust Bldg., Baltimore, Md.  
 Maurice Pincoffs Co., 421 Cotton Exchange Bldg., Houston, Texas.  
 Plantabbs Corp., 1 West Biddle St., Baltimore, Md.  
 Premier Poultry Manure Co., 327 South LaSalle St., Chicago, Ill.  
 Pulverized Manure Co., 828 Exchange Ave., Chicago, Ill.  
 Ramshorn Mills, West Millbury, Mass.  
 John Reardon & Sons Co., 51 Waverly St., Cambridge, Mass.  
 Rogers & Hubbard Co., Portland, Conn.  
 Charles T. Rouleau, Rigby St., Lancaster, Mass.  
 N. Roy & Son, 675 Washington St., Attleboro, Mass.  
 F. S. Royster Guano Co., 2006 First National Bank Bldg., Baltimore, Md.  
 F. Rynveld & Sons, 55 West 26th St., New York, N. Y.  
 Salem Chemical & Supply Co., Salem, Mass.  
 O. M. Scott & Sons Co., Marysville, Ohio.  
 A. S. Sergeant, 311 Marine Bank Bldg., Baltimore, Md.  
 M. L. Shoemaker & Co., Inc., 3600 North Delaware Ave., Philadelphia, Penn.  
 Smith Agricultural Chemical Co., Columbus, Ohio.  
 Springfield Rendering Co., Springfield Mass.  
 Standard Wholesale Phosphate & Acid Works, Inc., 1600 Continental Bldg., Baltimore, Md.  
 Stimuplant Laboratories, Inc., 42-26 28th St., Long Island City, N. Y.  
 Summers Fertilizer Co., 32 Stock Exchange Bldg., Baltimore, Md.  
 Sutton & Sons Ltd., The Royal Seed Establishment, Reading, England.  
 Swift & Company, Fertilizer Works, Court Square Bldg., Baltimore, Md.  
 F. Sylvester & Son, 86 Baxter St., Melrose, Mass.  
 Synthetic Nitrogen Products Corp., 285 Madison Ave., New York, N. Y.  
 Tennessee Corp., Lockland, Ohio.  
 Tobacco By-Products & Chemical Corp., Louisville, Ky.  
 Uniform Products Co., Inc., 111 Fifth Ave., New York, N. Y.  
 Van Horne Chemical Co., 399 Halliday St., Jersey City, N. J.  
 Van Iderstine Co., Long Island City, N. Y.  
 Victory Fertilizer Corp., 177 State St., Boston, Mass.  
 Virginia-Carolina Chemical Corp., National Marine Bank Bldg., Baltimore, Md.  
 Virginia-Carolina Chemical Corp., Richmond, Va.  
 Walker-Gordon Farms, Juliustown, N. J.  
 Walker-Gordon Laboratory Co., Inc., Plainsboro, N. J.  
 C. P. Washburn Co., Middleboro, Mass.  
 W. W. Windle Co., 95 West Main St., Millbury, Mass.  
 Woodard Bros., Greenfield, Mass.  
 Worcester Rendering Co., Auburn, Mass.





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MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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Control Series

Bulletin No. 70

December, 1933

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Inspection of Commercial  
Feedstuffs

By Philip H. Smith

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This is the thirty-ninth report of feeding stuffs inspection and presents the results of the chemical and microscopic analyses on 1649 samples of feeding stuffs intended for live stock and poultry consumption, collected during the year ending September 1, 1933.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.



## INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith<sup>1</sup>

During the past year 1,044 brands of feed have been registered for sale by 219 manufacturers and dealers; 1,649 samples of feeding stuffs have been collected and subjected to analysis; 200 dealers located in 107 towns and cities have been visited by the feed inspector at least once.

The intent of the Feeding Stuff Act is primarily to prevent deception and misrepresentation in the sale of commercial feeding stuffs. This it does to the extent of information required on the label. The law when enacted was consistent with the scientific knowledge of feeding stuffs of the time. It was written for a period now past, and in order to check properly claims for vitamin potency and other data resulting from more recent scientific discoveries, the Control Service is in urgent need of a biological laboratory. As a matter of justice to the trade and to the consuming public, laboratory facilities should be enlarged. Much could be done with the funds already coming into the State Treasury through feed registrations, of which less than one-half is appropriated for the work for which it is intended.

Of the 1,647 samples of feeding stuffs collected, only 38, or 2.3 per cent, were found to be one per cent or more below their protein and fat guarantee, or more than one per cent over the guarantee for fiber, and in no case to such an extent as to materially affect their feeding value.

<sup>1</sup>The following staff members assisted in the inspection: Albert F. Spelman and John W. Kuzmeski, Chemists; Frederick A. McLaughlin, Microscopist; James T. Howard, Inspector; Cora B. Grover, Clerk.

Complete Average Analyses of Feeds Collected (Per Cent).  
I. UNMIXED BY-PRODUCTS.  
(a) Protein Feeds.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
<b>Cottonseed Meal.</b>											
1	Monarch Brand Prime	Ashcraft-Wilkinson Co.	6.3	48.7	43.0	7.4	6.0	25.7	6.5	10.0	5.4
8	Helmet Brand Prime	Ashcraft-Wilkinson Co.	7.2	42.2	41.0	7.1	5.5	27.9	9.3	10.0	6.3
1	Paramount Brand Prime	Ashcraft-Wilkinson Co.	5.0	35.7	36.0	5.1	5.0	32.9	15.9	14.0	5.4
1	Miss Cairo Brand Prime 43%	Cairo Meal & Cake Co.	6.8	43.8	43.0	6.8	6.0	27.2	8.8	10.0	6.6
4	Miss Cairo Brand Prime 41%	Cairo Meal & Cake Co.	6.5	41.4	41.0	7.2	6.0	29.2	9.2	10.0	6.5
2	Miss Cairo Brand 36%	Cairo Meal & Cake Co.	6.3	37.9	36.0	6.2	5.0	29.5	13.5	12.0	6.6
1	Goodluck Brand 41% Prime Quality	S. P. Davis	8.0	42.6	41.0	8.0	6.0	25.7	9.1	10.0	6.6
1	Eastern States Choice	Eastern States Farmers' Exchange	7.9	40.5	41.0	6.5	6.0	29.1	9.2	10.0	6.8
3	Bull Brand	Humphreys-Godwin Co.	6.7	43.3	43.0	8.4	5.0	27.4	7.5	11.0	6.7
17	Dixie Brand	Humphreys-Godwin Co.	7.1	42.0	41.0	7.0	5.0	28.3	9.1	12.0	6.5
2	Danish Brand	Humphreys-Godwin Co.	7.7	36.3	36.0	6.8	5.0	30.3	12.3	15.0	6.6
3	High Grade	International Vegetable Oil Co., Inc.	6.6	41.7	41.0	6.4	6.0	29.4	10.0	10.0	5.9
1	41% Protein Prime Quality	Larroe Milling Co.	7.5	40.7	41.0	6.5	6.0	30.7	8.1	10.0	6.5
2	"Lovit Brand," 43%	L. B. Lovitt & Co.	6.6	44.5	43.0	7.3	6.0	26.8	8.0	10.0	6.8
2	"Lovit Brand," 41%	L. B. Lovitt & Co.	7.7	41.7	41.0	6.0	6.0	28.5	9.9	10.0	6.2
1	White Mule Brand	Marianna Sales Co.	6.9	41.9	41.0	7.4	6.0	29.3	9.0	10.0	5.5
1	Golden Rod Brand	Perkins Oil Co., Inc.	7.0	40.9	41.0	6.6	5.0	28.8	10.1	10.0	6.6
<b>Linseed Meal.</b>											
5	Pure Old Process	Archer-Daniels-Midland Co.	8.6	38.6	37.0	5.1	4.5	35.4	7.2	9.0	5.1
3	Bisbee Brand Old Process	Bisbee Linseed Co.	8.7	35.5	34.0	6.7	5.0	33.9	7.1	10.0	8.1
1	Pure Old Process	Hirst & Begley Linseed Works	8.7	39.1	37.0	6.3	5.0	34.6	6.8	9.0	4.5
8	"K & M," Brand Pure Old Process	Kelloggs & Miller, Inc.	8.1	36.3	34.0	6.0	5.0	35.9	7.5	9.0	6.2
2	Kellogg's 37% Protein Old Process	Spencer Kellogg & Sons, Inc.	8.1	40.7	37.0	5.5	5.0	34.7	5.9	10.0	5.1
6	Pure Old Process	Sherwin Williams Co.	8.8	38.4	34.0	5.6	5.0	35.3	7.1	10.0	4.8
2	Sherwin-Williams Screw press Linseed Oil Cake Meal	Sherwin-Williams Co. of Canada, Ltd.	7.3	32.1	35.0	7.2	6.5	39.7	8.3	8.0	5.4

## Complete Average Analyses of Feeds Collected (Per Cent)—Continued.

## I. UNMIXED BY-PRODUCTS—Continued.

## (a) Protein Feeds—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
<b>Oil Cake Meals.</b>											
1	Pure Old Process Soybean Oil Meal	Archer-Daniels-Midland Co.	7.7	44.0	41.0	6.0	4.5	32.0	5.0	7.0	5.3
3	Shellabarger's Cooked Soybean Oil Meal	Shellabarger Grain Products Co.	9.4	43.1	41.0	5.6	4.5	32.1	4.9	7.5	4.9
1	Super Soy	Soya Products, Inc.	8.7	38.5	37.0	6.5	5.0	32.9	5.1	6.5	8.3
4	Staley's Soybean Oil Meal	A. E. Staley Manufacturing Co.	9.1	43.6	41.0	5.2	4.5	32.0	5.1	7.0	5.0
<b>Gluten Meal.</b>											
4	Amazo	American Maize-Products Co.	8.6	45.6	40.0	1.5	1.0	41.1	1.6	4.0	1.6
6	Diamond	Corn Products Refining Co.	8.5	43.3	40.0	1.7	1.0	43.7	1.7	4.0	1.1
5	Douglas	Penick & Ford Ltd., Inc.	8.5	42.8	40.0	1.7	1.0	40.1	3.8	4.0	3.1
1	Union	Union Starch & Refining Co.	6.4	44.7	40.0	1.6	1.0	44.4	1.9	4.0	1.0
<b>Gluten Feed.</b>											
3	Cream of Corn	American Maize-Products Co.	8.0	29.1	23.0	3.3	2.0	47.9	7.1	8.5	4.6
1	Anheuser-Busch Brand	Anheuser-Busch, Inc.	5.5	31.1	25.0	1.8	2.0	50.9	7.0	8.5	3.7
6	Clinton	Clinton Corn Syrup Refining Co.	9.8	29.3	25.0	3.0	2.0	46.3	5.8	8.5	5.8
6	Buffalo	Corn Products Refining Co.	9.7	26.0	23.0	2.3	2.0	49.1	7.1	8.5	5.8
1	Heavy Buffalo, Sweetened	Corn Products Refining Co.	12.7	22.8	20.0	1.4	1.0	53.2	5.4	7.0	4.5
9	Douglas	Penick & Ford Ltd., Inc.	10.8	26.8	25.0	1.9	1.5	47.0	7.2	8.5	6.3
1	Douglas Sweetened	Penick & Ford Ltd., Inc.	12.6	23.5	20.0	1.4	1.0	49.6	5.6	7.0	7.3
5	Staley's	A. E. Staley Manufacturing Co.	9.6	28.0	23.0	2.1	1.0	48.3	5.9	8.0	6.1
3	Union	Union Starch & Refining Co.	12.0	25.8	23.0	2.1	1.0	47.3	7.0	8.0	5.8
<b>Distillers' Grains.</b>											
3	Eagle 3D (Dewey's)	Dewey Bros. Co.	7.9	31.5	30.0	11.2	10.0	37.2	7.9	13.0	4.3
1	Corn Distillers' Dried Grains	St. Albans Grain Co.	7.5	28.6	28.0	9.8	8.0	42.1	8.6	14.0	3.4
<b>Brewers' Grains.</b>											
1	Blatz	Blatz Brewing Co.	6.5	22.4	20.0	7.0	5.0	42.4	17.4	18.0	4.3
6	Hiquality	Donahue Stratton Co.	6.1	23.5	20.0	5.9	5.0	44.7	16.0	19.0	3.8
1	"Bull Brand"	Farmers Feed Co.	5.4	24.8	24.0	6.0	6.0	44.3	15.9	17.0	3.6
1	Brewers' Dried Grains	St. Albans Grain Co.	5.9	27.3	21.0	6.5	5.0	42.6	13.7	15.0	4.0



**Complete Average Analyses of Feeds Collected (Per Cent)—Continued.**  
**I. UNMIXED BY-PRODUCTS—Continued.**  
**(a) Protein Feeds—Concluded.**

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Wheat Standard Middlings — (Concluded)</b>										
2	*Pillsbury's Hard Wheat Standard B Middlings	Pillsbury Flour Mills Co.	8.5	17.6	15.0	5.7	4.0	55.7	7.8	9.5	4.7
1	Hard Wheat Occident Standard Middlings	Russell-Miller Milling Co.	8.8	19.5	15.0	6.3	4.0	52.7	7.8	9.5	4.9
1	*Victor Spring Wheat Middlings	Victor Flour Mills, Inc.	9.2	18.4	17.0	5.4	5.0	55.6	6.5	9.5	4.9
	<b>Wheat Mixed Feed.</b>										
1	Amco Mixed Feed	Amendt Milling Co.	10.6	16.9	15.0	4.5	4.0	56.4	6.3	8.0	5.3
1	Capital Mixed Feed	E. W. Bailey & Co.	8.1	18.7	14.0	4.9	3.0	58.3	5.3	7.0	4.7
1	*Prize Mixed Feed	C. W. Brister & Son	10.2	15.8	14.0	4.4	3.5	59.9	6.4	9.0	4.5
1	*Sunfed Wheat Mixed Feed	Commander-Larabee Corp.	9.0	17.5	15.0	4.9	4.0	53.5	8.3	8.5	5.6
2	Courcy's Heavy Mixed Feed	Nicolas Courcy	10.3	16.5	16.0	4.2	4.5	58.3	5.5	7.0	5.2
2	Coweco Heavy Mixed Feed	E. A. Cowee Co.	8.2	15.7	15.0	4.0	4.0	62.0	5.8	7.0	4.3
1	D. & G. Wheat Mixed Feed	Dietrich & Gambrell, Inc.	9.6	17.4	15.0	4.2	3.5	59.2	4.9	7.5	4.7
2	Full Value Mixed Feed	J. L. Dunnell & Son	8.3	16.8	15.0	4.4	5.0	60.4	5.7	6.0	4.4
1	Pure Camel Fancy Wheat Feed	Excelsior Milling Co.	9.2	16.0	16.0	4.5	3.5	58.1	7.1	8.5	5.1
8	*Lucky Hard Wheat Mixed Feed	Federal Mill, Inc.	8.2	17.8	14.5	5.3	3.5	55.1	8.2	10.5	5.4
1	Royal Worcester Fancy Mixed Feed	J. B. Garland & Son	9.6	16.5	16.0	3.5	4.0	61.3	4.8	7.0	4.3
1	*Washburn's Gold Medal Fancy Mixed Feed	General Mills, Inc.	9.9	17.3	15.0	4.1	3.5	58.6	5.6	7.5	4.5
1	"Gold Mine" Feed	H. H. King Flour Mills Co.	9.3	18.3	15.0	5.2	4.5	54.0	8.0	9.5	5.2
2	*B B Bull Brand Heavy Mixed Feed	Maritime Milling Co., Inc.	9.3	17.3	15.0	4.8	4.0	57.8	6.3	8.0	4.5
1	*Moon's Fresh Ground Mixed Feed	Geo. Q. Moon & Co., Inc.	10.7	14.8	15.0	3.3	4.0	62.1	5.2	10.0	3.9
1	*Big B Mixed Feed	Moseley & Motley Milling Co.	9.2	18.0	15.0	5.7	4.0	53.0	8.6	12.0	5.5
1	Planet Feed	Northwestern Consolidated Milling Division of Standard Milling Co.	7.9	19.7	15.0	5.0	4.0	57.5	5.3	8.0	4.6
1	*Park & Pollard Light Wheat Mixed Feed	Park & Pollard Co.	9.7	17.8	15.3	5.4	3.85	56.0	7.4	10.25	3.7
1	*Pillsbury's Fancy Mixed Feed	Pillsbury Flour Mills Co.	9.7	18.0	15.0	4.6	4.0	58.4	5.6	8.5	3.8
10	*Hard Wheat Occident Mixed Feed	Russell-Miller Milling Co.	10.1	18.6	15.0	5.6	4.5	53.6	7.6	9.5	4.8
5	*Wirthmore Wheat Feed	St. Albans Grain Co.	9.7	16.8	15.0	4.2	4.0	59.0	5.7	8.0	4.6
2	*Litchfield Mixed Feed	F. W. Stock & Sons	9.5	16.0	16.0	4.4	4.0	58.6	6.7	8.0	4.9
5	*Stratton's Mixed Feed	Stratton & Co.	9.1	15.4	13.5	4.3	4.11	59.9	6.7	7.13	4.2
1	Kent Mixed Feed Winter Wheat	Williams Brothers Co.	9.2	15.5	13.0	3.9	3.5	59.7	6.7	9.5	5.0



**Complete Average Analyses of Feeds Collected (Per Cent)—Continued.**  
**I. UNMIXED BY-PRODUCTS—Concluded.**  
**(b) Starchy Feeds—Concluded.**

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
1	<b>Hominy Feed—Concluded</b>	Kellogg Co.	7.0	12.3	9.0	5.1	4.0	67.8	3.2	3.5	4.6
7		Hexite Sweet Hominy	8.4	12.1	10.0	7.3	6.0	65.1	4.2	5.0	2.9
1		Badger White	10.0	10.0	10.0	7.7	5.0	66.8	3.2	6.0	2.3
5		Moon's	9.2	11.5	10.0	7.5	6.0	65.3	3.8	5.0	2.7
3		Burt's	9.9	10.7	10.0	6.3	5.0	67.6	3.4	6.0	2.1
4		Pratt's Yellow	10.0	11.3	9.5	6.4	4.0	66.4	3.9	5.0	1.6
1		White	9.9	10.6	9.5	5.3	4.0	69.5	3.1	5.0	1.6
3		Yellow	8.3	11.9	10.0	7.1	6.0	66.4	3.5	7.0	2.8
	<b>Dried Beet Pulp.</b>	St. Albans Grain Co.									
5		Larrowe Milling Co.	8.8	9.1	8.0	0.6	0.5	59.0	19.6	22.0	2.9
7		Larrowe Milling Co.	7.9	9.0	8.0	0.6	0.4	59.4	20.1	22.0	3.0
1	<b>Dried Molasses-Beet Pulp</b>	Larrowe Milling Co.	8.9	11.3	8.0	0.8	0.5	60.0	15.4	20.0	3.8
5		Upper Hudson Rye Flour Mills, Inc.	9.4	17.1	15.5	3.2	3.0	62.7	4.3	6.0	3.3
	<b>Oat Feed.</b>	Northern Illinois Cereal Co.	7.2	3.5	3.5	1.2	1.25	49.9	31.3	35.0	6.9
1		Quaker Oats Co.	7.1	5.5	5.0	1.8	1.25	55.1	24.5	27.5	6.0
5		Quaker Oats Co.	5.6	4.6	5.0	1.7	2.0	50.0	30.3	30.0	6.8
1		Quaker Oats Co.									

**II. PREPARED FEEDS.**

**(a) Protein Feeds.**

	Dairy and Molasses Feeds (more than 15 per cent protein).		Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
2	<b>Dairy and Molasses Feeds (more than 15 per cent protein).</b>	Allied Mills, Inc.	8.9	25.5	24.0	4.0	3.5	48.3	6.8	9.0	6.5
5		Amco 24% Dairy Ration	9.3	22.4	20.0	3.9	3.5	50.9	7.1	9.0	6.4
1		Amco 20% Dairy Ration	10.0	20.2	20.0	4.2	3.5	51.3	7.8	12.5	6.5
2		Wayne 20% Supreme Dairy Feed	9.4	20.0	18.0	4.3	4.0	51.6	8.2	12.0	6.5
1		Empire Dairy Feed	8.6	25.7	24.0	4.3	5.0	44.3	8.7	10.0	8.4
1		24% Milk Maker	9.2	20.8	20.0	4.0	4.5	50.0	7.3	9.0	8.7
1		20% Balanced Ration	8.5	29.2	25.0	4.2	4.0	42.7	8.2	10.0	7.2
1		Advanced Registry 25% Dairy Ration									
1		Academy 24% Open Formula Production Ration	9.4	22.8	24.0	3.1	4.0	51.9	6.5	9.0	6.3
4		Academy 20% Open Formula Production Ration	10.7	20.2	20.0	3.2	3.5	51.8	7.0	9.0	7.1



5	Old Colony Feed . . . . .	9.0	21.7	20.0	4.1	3.5	50.1	9.1	11.0	6.0
1	Peerless Milk Ration . . . . .	10.2	21.4	20.0	3.3	3.5	48.9	9.0	12.0	7.4
1	Producer's 20% Ready Ration . . . . .	7.0	21.2	20.0	3.2	3.5	54.4	7.4	10.0	6.8
3	Profit-Maker 24% Dairy Ration . . . . .	9.6	25.8	24.0	4.8	4.0	46.0	6.5	8.0	7.3
2	More-Value 20% Dairy Ration . . . . .	9.8	22.0	20.0	3.3	3.15	47.4	11.9	13.5	5.6
2	Profit-Maker 20% Dairy Ration . . . . .	10.0	22.3	20.0	4.4	4.0	49.2	7.0	8.0	7.1
2	Capital Dairy Ration . . . . .	9.3	25.9	24.0	5.5	5.0	46.4	6.9	9.0	6.0
1	Bailey's Open Formula 20% Dairy Ration . . . . .	9.9	22.5	20.0	5.1	4.5	49.5	7.0	9.0	6.0
1	Our 20% Special Dairy Ration . . . . .	10.0	20.1	20.0	3.4	3.5	50.7	9.0	9.0	6.6
1	Beacon Dairy Ration . . . . .	8.7	25.3	24.0	4.9	4.5	46.8	7.7	9.0	6.6
3	Beacon Sweet '24" . . . . .	9.9	25.4	24.0	4.5	4.0	46.2	6.9	9.0	7.1
2	Auburn Dairy Feed . . . . .	10.1	21.8	20.0	3.8	4.0	50.0	6.5	10.0	7.8
1	Beacon Sweet '20" . . . . .	9.4	21.4	20.0	5.1	4.5	50.7	8.6	9.0	4.8
1	Green Mountain Dairy Ration . . . . .	9.3	23.5	23.0	4.6	5.0	48.4	8.9	10.0	5.3
3	Bidwell 24% Dairy Ration . . . . .	10.1	24.1	24.0	3.1	4.0	49.0	7.1	11.0	6.6
3	Bidwell 20% Dairy Ration . . . . .	10.7	21.4	20.0	3.9	4.0	49.7	7.9	11.0	6.4
4	Bidwell 20% Dairy Ration . . . . .	9.0	21.6	22.0	5.1	4.5	52.8	6.5	9.0	5.0
2	Borden's Dairy Feed . . . . .	8.7	22.8	20.0	4.2	4.0	49.8	7.0	8.5	6.3
1	Community-20% Dairy Ration . . . . .	9.2	21.6	20.0	5.4	3.25	47.2	11.5	12.5	6.3
2	Hilltop-20% Dairy Ration . . . . .	9.3	23.1	22.0	4.4	4.5	53.4	5.0	7.0	4.8
1	Cowsey's Dairy Feed . . . . .	8.3	23.3	24.0	4.9	4.5	48.3	8.4	10.0	6.8
1	Coweco 1925 Ration . . . . .	8.0	21.0	20.0	4.3	4.0	52.7	7.3	10.0	6.7
1	Coweco 20% Ration . . . . .	8.6	21.7	20.0	4.0	3.5	50.3	7.6	9.0	7.8
1	Coweco Lo-Price 20% Dairy Ration . . . . .	8.6	25.0	24.0	4.3	5.0	47.7	7.5	9.0	6.9
1	Crystal 24% Dairy Ration . . . . .	8.6	22.4	20.0	4.1	4.0	49.4	8.4	12.0	7.1
1	Crystal 20% Ration . . . . .	8.2	23.5	22.0	4.3	4.5	49.2	7.4	9.0	7.4
1	King 22 Milk Ration Sweetened . . . . .	8.4	21.7	20.0	4.0	4.0	50.3	8.7	11.0	6.9
1	King Dairy Feed with Beet Pulp Sweetened . . . . .	8.5	24.7	24.0	5.2	5.0	47.4	8.3	10.0	5.9
1	Delco 24% Dairy Feed . . . . .	8.9	20.5	20.0	5.0	4.0	48.9	9.9	11.0	6.8
2	Delco 20% Dairy Feed . . . . .	9.6	20.7	20.0	5.7	4.0	48.6	9.2	12.0	6.2
2	Indian Sweet 20% Dairy Feed . . . . .	9.6	18.0	17.0	3.9	3.92	55.6	7.6	7.74	5.3
1	Diato's Dairy Feed . . . . .	8.0	20.6	18.0	4.6	3.0	51.2	9.7	14.0	5.9
1	Diehl's Dairy Feed . . . . .	9.5	24.8	24.0	4.8	4.6	46.4	7.5	9.0	7.0
3	Gambrell's A-1 Dairy Feed . . . . .	8.7	21.3	20.0	4.0	4.0	45.0	11.5	12.0	9.5
2	D. & G. Dairy Feed . . . . .	10.6	22.5	20.0	4.9	4.0	46.6	7.3	9.0	8.1
1	Pen Man Dairy Feed . . . . .	9.6	17.8	16.0	4.0	3.5	48.8	11.2	12.0	8.6
1	Gambrell's 16% Dairy Feed . . . . .	8.1	26.4	24.0	5.0	4.5	45.7	7.5	10.0	7.3
1	XL Dairy Ration 24% . . . . .	8.1	21.4	20.0	4.7	4.5	51.5	7.5	10.0	6.8
2	Excel 20% Dairy Ration . . . . .	8.1	21.4	20.0	4.7	4.5	51.5	7.5	10.0	6.8
1	Special Dairy Feed . . . . .	10.5	20.1	20.0	4.1	4.0	54.0	7.2	9.0	4.1
1	East Bridgewater Farmers Cooperative Exchange, Inc. . . . .	9.8	25.5	24.0	5.2	4.0	45.6	7.1	8.5	6.8
2	Eastern Grain Co. . . . .	9.6	24.6	20.0	4.3	4.0	50.7	7.3	8.0	6.5
4	Eastern Grain Co. . . . .	9.7	14.8	14.0	3.2	3.2	56.0	11.5	15.0	4.8
4	Eastern All-Purpose Dairy Feed . . . . .	9.7	14.8	14.0	3.2	3.2	56.0	11.5	15.0	4.8



## Complete Average Analyses of Feeds Collected (Per Cent)—Continued.

## II. PREPARED FEEDS—Continued.

## (a) Protein Feeds—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
1	Dairy and Molasses Feeds (more than 15 per cent protein) — Cont. Eastern States 32% Supplement Feed Eastern States Milkmore Dairy Ra- tion Eastern States Fulpail Dairy Ration Eastern States Highland 20 Eastern States Highland 16 Eastern States Sixteen Dairy Ration The Ellis Dairy Feed Elmore 32% Supplemental Dairy Ra- tion Elmore Milk Grains Elmore's Economilk 24% Dairy Feed Economilk Dairy Feed Elmore Milk Grains Junior Emco Feed Granger 20% Dairy Ration Osage Economy Ration Elmore 16% Pasture Ration Elmore's Sweet Digesto Dairy Feed Eshelman Golden Rod 25 Dairy Feed Eshelman Challenge Dairy Feed Eshelman Red Rose 24 Dairy Feed Eshelman Certified 20% Dairy Ra- tion Eshelman Conestoga 20 Dairy Feed Eshelman Lancaster 20 Dairy Feed Eshelman Open Formula 20 Dairy Feed Diamond A Dairy Feed	Eastern States Farmers' Exchange	9.0	33.2	32.0	5.4	4.5	39.2	6.4	8.0	6.8
1		Eastern States Farmers' Exchange	9.7	25.5	24.0	4.6	4.5	47.6	6.4	8.0	6.2
3		Eastern States Farmers' Exchange	9.8	21.9	20.0	4.6	4.5	51.3	6.6	8.0	5.8
1		Eastern States Farmers' Exchange	9.3	21.3	20.0	4.3	4.0	49.2	10.7	12.0	5.2
1		Eastern States Farmers' Exchange	9.7	17.5	16.0	4.2	3.5	53.1	9.9	11.0	5.6
2		Eastern States Farmers' Exchange	9.7	18.0	16.0	4.8	4.0	56.0	6.3	8.0	5.2
1		Michael W. Ellis	8.8	25.3	22.0	4.4	4.0	49.3	6.5	9.0	5.7
1		Elmore Milling Co., Inc.	9.7	30.6	32.0	5.3	4.0	41.7	7.8	9.0	4.9
4		Elmore Milling Co., Inc.	8.9	27.9	25.0	5.0	5.0	44.7	8.4	11.0	5.1
3		Elmore Milling Co., Inc.	8.9	25.4	24.0	4.6	4.0	44.5	8.8	10.0	7.8
5		Elmore Milling Co., Inc.	9.0	21.4	20.0	4.4	4.0	48.1	10.1	11.0	7.0
1		Elmore Milling Co., Inc.	9.5	22.2	20.0	5.3	5.0	49.8	6.7	10.0	6.5
2		Elmore Milling Co., Inc.	8.7	22.1	20.0	4.5	4.5	50.3	8.6	10.0	5.8
3		Elmore Milling Co., Inc.	6.3	23.3	20.0	4.3	4.0	46.4	10.4	11.0	9.3
2		Elmore Milling Co., Inc.	9.3	22.7	20.0	4.7	4.0	48.0	8.1	11.0	7.2
1		Elmore Milling Co., Inc.	10.9	21.8	16.0	3.9	3.5	49.0	8.1	10.0	6.3
1	Elmore Milling Co., Inc.	8.6	18.6	16.0	4.8	4.0	50.0	11.6	12.0	6.4	
2	John W. Eshelman & Sons	8.6	26.3	23.0	4.8	5.0	44.6	8.8	11.0	6.9	
3	John W. Eshelman & Sons	9.2	24.8	24.0	4.3	4.0	45.9	7.8	11.0	8.0	
2	John W. Eshelman & Sons	8.8	26.4	24.0	3.9	4.0	46.2	7.4	11.0	7.3	
1	John W. Eshelman & Sons	9.2	23.9	20.0	5.4	4.0	50.4	6.7	8.0	5.4	
3	John W. Eshelman & Sons	9.3	23.1	20.0	4.2	4.0	47.6	8.0	11.0	7.8	
4	John W. Eshelman & Sons	9.0	22.6	20.0	4.2	4.0	49.2	7.7	11.0	7.3	
2	John W. Eshelman & Sons	8.6	22.8	20.0	4.4	4.0	48.8	7.9	9.0	7.5	
2	Farm Service Stores, Inc.	8.3	27.1	24.0	4.5	5.0	45.6	8.7	8.0	5.8	

3	Big C Special Dairy Feed	Farm Service Stores, Inc.	9.0	23.3	21.0	5.0	48.8	8.1	9.0	5.8
2	Diamond C Dairy Feed	Farm Service Stores, Inc.	9.8	22.9	21.0	4.5	50.6	7.8	10.0	4.4 <sup>1</sup>
4	New England Dairy Ration	Farm Service Stores, Inc.	8.2	20.9	20.0	3.8	50.5	10.6	11.5	6.0
3	Vigor 16% Dairy Feed	Farm Service Stores, Inc.	9.2	19.8	16.0	3.4	51.2	8.8	11.0	7.6
2	Flory's Dairy Feed	Flory Milling Co., Inc.	9.2	24.7	24.0	4.3	45.8	9.4	11.0	6.6
2	Record Dairy Feed	Flory Milling Co., Inc.	10.1	23.1	20.0	4.0	48.5	7.5	9.0	6.8
1	Sunray Dairy Feed	Flory Milling Co., Inc.	10.7	21.2	20.0	4.6	50.1	6.6	9.0	6.8
1	Garland's 24% Ration	J. B. Garland & Son	9.8	24.8	24.0	4.1	48.6	7.4	10.0	5.3
1	Royal Worcester Complete Ration	J. B. Garland & Son	11.1	20.7	20.0	4.0	49.5	8.3	10.0	6.4
1	Garland's Economy 20% Dairy Ration	J. B. Garland & Son	10.3	23.5	20.0	4.4	48.3	7.4	9.0	6.1
3	Eventually Gold Medal Dairy Ration	General Mills, Inc.	8.3	21.3	20.0	4.7	51.1	7.2	8.5	7.4
4	Grandin's 24 Balanced Dairy Ration	D. H. Grandin Milling Co.	8.4	24.8	24.0	5.0	46.6	7.8	10.0	6.5
2	Grandin's Sweetened 24% Dairy Feed	D. H. Grandin Milling Co.	9.5	24.7	24.0	5.0	47.9	6.8	10.0	6.1
4	Grandin's Sweetened 12 Twin Six 12 Dairy Feed	D. H. Grandin Milling Co.	9.0	24.1	22.0	5.2	47.1	7.8	12.0	6.8
1	Grandin's Milk Maker	D. H. Grandin Milling Co.	9.5	21.6	20.0	5.0	49.9	7.4	12.0	5.6
3	M-S (Money Saver) 20% Sweet Dairy Feed	D. H. Grandin Milling Co.	8.9	20.3	20.0	4.2	48.8	10.0	12.0	7.8
2	Grandin's Sweetened 16% Dairy Feed	D. H. Grandin Milling Co.	9.9	19.1	16.0	4.5	53.8	6.8	10.0	5.9
1	Red Horn 20% Dairy Feed	Hales & Hunter Co.	9.7	22.4	20.0	5.0	49.0	7.0	8.0	6.9
1	Farmer Boy 24% Dairy Ration with Molasses	J. B. Ham Co.	10.2	25.5	24.0	4.2	45.6	7.0	8.0	7.5
2	Farmer Boy 20% Dairy Ration with Molasses	J. B. Ham Co.	9.1	21.2	20.0	4.9	51.9	6.4	8.0	6.5
2	Farmer Boy 18% Dairy Ration with Molasses	J. B. Ham Co.	8.9	19.9	18.0	3.0	47.9	12.3	12.0	8.0
2	Welcome Dairy Feed	D. Harbeck	8.5	23.3	20.0	4.7	51.8	7.4	10.0	4.3
1	Wantmore 24% Dairy Ration Sweetened	Horvitz Grain Co.	10.3	25.2	24.0	4.3	45.3	7.6	8.5	7.3
1	Wantmore Dairy Ration	Horvitz Grain Co.	9.7	24.1	20.0	4.7	48.9	7.1	10.0	5.5
1	Wantmore Dairy with Beet Pulp	Horvitz Grain Co.	9.2	22.5	20.0	3.9	51.3	7.9	10.0	5.2
1	Wantmore 20% Dairy Ration Sweetened	Horvitz Grain Co.	10.3	22.1	20.0	4.2	48.8	8.1	8.0	6.5
14	Larro — The Ready Ration for Dairy Cows	Larowe Milling Co.	9.2	21.8	20.0	4.2	50.4	9.5	12.0	4.9
2	"Mansfield" Cow-Ration	Mansfield Milling Co.	9.4	21.3	20.0	4.6	53.2	6.5	9.0	5.0
1	B B Bull Brand Dairy Ration	Maritime Milling Co., Inc.	8.0	24.0	20.0	4.0	48.5	9.5	11.0	6.0
3	Sweetened B B Bull Brand "24" Dairy Ration	Maritime Milling Co., Inc.	9.9	25.6	24.0	4.5	45.4	8.3	11.0	6.3
1	B B Hi-Test Dairy Feed 24% Pro. Sweetened	Maritime Milling Co., Inc.	9.0	24.3	24.0	4.7	46.3	8.9	12.0	6.8
1	Sweetened Dollar Maker Dairy Feed 24%	Maritime Milling Co., Inc.	9.9	24.3	24.0	3.9	47.1	9.1	12.0	5.7
3	Sweetened Dollar Maker 20% Dairy Feed	Maritime Milling Co., Inc.	9.4	21.9	20.0	3.6	49.4	9.6	12.0	6.1

## Complete Average Analyses of Feeds Collected (Per Cent)—Continued.

## II. PREPARED FEEDS—Continued.

## (a) Protein Feeds—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
7	Dairy and Molasses Feeds (more than 15 per cent protein)—Cont.										
	B B Hi-Test Dairy Feed 20% Sweetened	Maritime Milling Co., Inc.	9.6	20.4	20.0	4.6	4.5	48.6	9.9	12.0	6.9
3	B B Marmico 16% Protein Dairy Feed with Molasses	Maritime Milling Co., Inc.	10.4	17.1	16.0	4.0	4.0	50.9	10.3	12.0	7.3
1	Moon's 24% Dairy Ration	Geo. Q. Moon & Co., Inc.	9.8	25.6	24.0	4.7	5.0	45.7	6.7	10.0	7.5
2	Butterfat Dairy Feed with Molasses	Ontario Milling Co., Inc.	10.4	25.2	24.0	5.1	5.0	46.1	7.3	10.0	5.9
1	Oswego 24% Dairy Feed with Molasses	Ontario Milling Co., Inc.	10.9	24.4	24.0	5.1	4.0	48.1	5.9	12.0	5.6
4	Big Value 20% Dairy Feed with Molasses	Ontario Milling Co., Inc.	9.3	23.3	20.0	5.0	4.5	49.2	7.4	10.0	5.8
9	Oswego 20% Dairy Feed with Molasses	Ontario Milling Co., Inc.	10.2	19.8	20.0	4.4	4.0	63.8	6.2	12.0	5.6
3	Milk-Maid 24% Sweetened Dairy Ration	Park & Pollard Co.	9.8	24.0	24.0	4.0	4.5	48.0	7.2	11.0	7.0
2	Overall 24% Dairy Ration	Park & Pollard Co.	9.4	26.3	24.0	4.6	4.5	46.1	7.3	9.0	6.3
1	Bel-R-Milk 20% Ration	Park & Pollard Co.	12.0	21.4	20.0	3.5	4.0	50.2	5.9	9.0	7.0
1	Parker's Special Dairy Ration	George H. Parker Grain Co.	7.6	20.3	19.0	4.6	4.0	49.3	11.5	12.0	6.7
1	A. D. P. 24% Dairy Ration	W. N. Potter Grain Stores, Inc.	9.4	26.8	24.0	4.8	4.0	48.9	6.2	10.0	3.9
1	Potter's Sweetened Dairy Ration	W. N. Potter Grain Stores, Inc.	8.3	22.5	20.0	4.4	4.0	52.6	6.5	10.0	5.7
1	Producer Dairy Feed	H. C. Puffer Co.	9.7	23.2	20.0	3.8	3.5	50.7	7.2	10.0	5.4
3	Purina 34% Cow Chow	Purina Mills	8.4	36.7	34.0	3.9	3.0	37.5	8.4	12.0	5.1
1	Protena 24% Dairy Feed (Buffalo Mill)	Purina Mills	10.2	26.6	24.0	5.5	3.0	42.2	9.1	14.0	6.4
3	Purina 24% Cow Chow	Purina Mills	9.6	26.9	24.0	4.6	3.0	44.5	9.0	12.0	5.4
1	Protena 20% Dairy Feed	Purina Mills	10.0	22.9	20.0	4.5	3.0	49.1	8.0	14.0	5.5
4	Purina 20% Cow Chow	Purina Mills	9.7	22.4	20.0	3.9	3.0	48.7	9.4	12.0	5.9
2	Quaker 24% Protein Dairy Ration	Quaker Oats Co.	7.9	24.7	24.0	4.4	4.0	45.9	10.6	12.0	6.4
2	Quaker 20% Protein Dairy Ration	Quaker Oats Co.	7.9	20.3	20.0	3.9	3.25	50.7	10.8	12.0	6.5
2	Quaker 16% Protein Dairy Ration	Quaker Oats Co.	8.4	17.3	16.0	4.1	3.5	52.7	11.8	13.5	5.7
1	Ropes Balanced Ration	Reuben W. Ropes	7.8	22.4	22.0	5.2	5.0	52.0	6.9	10.0	5.7

1	Ropes Sweet Ration	Reuben W. Ropes	8.5	21.6	20.0	5.3	5.0	53.3	6.7	10.0	4.6
1	Blue Tag Dairy Ration	Ryther & Warren	9.1	21.9	20.0	5.0	4.5	50.6	8.1	10.0	5.3
2	Wirthmore 25 Balanced Ration	St. Albans Grain Co.	8.1	26.1	25.0	5.3	5.0	46.1	8.5	9.0	5.9
3	Wirthmore 25 Balanced Ration Sweetened	St. Albans Grain Co.	9.2	25.7	25.0	5.0	4.75	46.5	7.0	8.5	6.6
2	Hygrade 24 Sweetened Milk Ration	St. Albans Grain Co.	10.0	23.7	24.0	4.3	3.5	50.1	6.4	9.0	5.5
4	Hygrade 20 Sweetened Milk Ration	St. Albans Grain Co.	10.1	20.9	20.0	4.4	3.5	52.0	6.8	8.5	5.8
1	Paragon Dairy Feed Sweetened	St. Albans Grain Co.	9.9	22.1	20.0	3.9	3.25	50.4	7.7	11.0	6.0
1	Utility Dairy Ration	St. Albans Grain Co.	9.5	20.7	20.0	3.6	3.5	50.4	9.3	10.5	6.9
1	Wirthmore 20 Dairy Feed	St. Albans Grain Co.	9.5	20.4	20.0	5.3	5.0	53.4	6.9	8.5	4.6
6	Wirthmore 20 Dairy Feed Sweetened	St. Albans Grain Co.	10.3	21.0	20.0	4.7	4.75	52.1	6.4	8.0	5.5
2	Wirthmore Dairy Feed with Beet	St. Albans Grain Co.	9.3	24.0	20.0	3.8	4.0	48.5	8.2	11.0	6.2
1	Hygrade 16 Sweetened Milk Ration	St. Albans Grain Co.	9.4	16.5	16.0	4.1	3.5	59.2	6.2	8.5	4.6
2	Wirthmore 16 Dairy Ration Sweetened	St. Albans Grain Co.	10.8	16.3	16.0	4.4	4.0	57.0	5.0	8.0	6.5
1	Syracuse Dairy Feed	Syracuse Milling Co.	9.8	24.7	24.0	5.2	4.5	46.8	9.1	12.0	4.4
1	Syracuse Dairy Feed Sweetened	Syracuse Milling Co.	10.5	26.4	24.0	5.4	4.5	44.1	7.4	12.0	6.2
1	E-Gee Dairy Feed	Tioga-Empire Feed Mills, Inc.	12.6	22.9	20.0	3.6	3.5	49.5	5.8	10.0	5.6
1	Or-Co Feed	Tioga-Empire Feed Mills, Inc.	10.6	21.1	18.0	3.5	3.0	48.7	10.2	12.0	5.9
2	Red Brand Tioga Dairy Feed	Tioga-Empire Feed Mills, Inc.	9.9	27.0	24.0	5.1	4.5	45.8	6.7	10.0	5.5
1	Union Grains Ubiko 20% Sweet Dairy Ration	Ubiko Milling Co.	8.2	21.4	20.0	4.1	4.0	50.1	8.2	10.0	8.0
1	United Farmers Milk Pep	United Co-Operative Farmers, Inc.	8.6	26.3	24.0	5.1	4.5	46.9	7.0	8.0	6.1
1	United Farmers Milkmaker	United Co-Operative Farmers, Inc.	8.6	22.6	20.0	5.4	4.0	48.5	7.7	8.0	7.2
3	"Made Right" Balanced Ration	C. P. Washburn Co.	9.0	24.9	22.0	4.0	5.0	47.5	9.1	10.0	5.5
3	"Made Right" Sweet Dairy Feed	C. P. Washburn Co.	10.3	22.9	20.0	4.2	4.0	49.8	7.0	8.0	5.8
2	Blue Seal "Hom-Mix" 24% Dairy Ration	H. K. Webster Co.	8.4	23.8	24.0	7.0	6.0	45.1	9.5	10.0	6.2
2	Blue Seal Improved Balanced Ration	H. K. Webster Co.	8.6	23.8	24.0	6.8	5.0	48.6	7.0	8.5	5.2
1	Blue Seal "21" Dairy Ration	H. K. Webster Co.	9.2	23.0	21.0	7.1	5.0	48.8	7.1	8.5	4.8
2	Blue Seal "20" Dairy Ration	H. K. Webster Co.	9.5	22.5	20.0	6.0	5.0	48.8	7.3	8.5	5.9
1	Blue Seal "Lo-Cost" Dairy Ration	H. K. Webster Co.	8.9	22.2	20.0	7.5	5.0	46.5	10.9	10.5	4.0
1	Blue Seal Special 20% Dairy Ration	H. K. Webster Co.	5.9	21.5	20.0	8.5	5.5	47.0	10.0	10.0	7.1
1	Super Pure Feed Dairy Ration	West-Nesbitt, Inc.	8.7	27.9	24.0	4.5	5.0	43.6	8.0	10.0	5.3
2	All Pure 20% Milk Ration	West-Nesbitt, Inc.	9.9	23.8	20.0	4.5	4.5	49.5	7.0	10.0	5.3
2	Pure Sweetfeed Dairy Ration	West-Nesbitt, Inc.	9.3	26.1	20.0	4.3	4.0	47.6	7.2	10.0	5.5
2	Williams' Balanced Ration	Est. M. G. Williams	8.7	22.7	20.0	5.2	4.0	49.9	8.2	12.0	5.3
2	Bliss Dairy Ration	Stanley Wood Grain Co.	7.8	23.1	22.0	4.6	5.0	52.5	6.1	10.0	5.9
2	Wood's Dairy Ration	Stanley Wood Grain Co.	9.1	21.7	20.0	5.0	5.0	50.3	7.9	10.0	6.0

Complete Average Analyses of Foods Collected (Per Cent)—Continued.  
 II. PREPARED FEEDS—Continued.  
 (a) Protein Feeds—Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.	
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.		
<b>Hog Feeds.</b>												
1	Gambrell's Hog Meal	Dietrich & Gambrell, Inc.	8.7	20.0	18.0	4.9	4.0	53.3	4.4	8.0	8.7	
1	Eastern States Hog Meal	Eastern States Farmers' Exchange	11.7	16.1	14.5	4.7	4.0	58.4	3.0	5.5	6.1	
2	Larroe Pork-Maker	Larroe Milling Co.	7.9	27.1	25.0	5.7	5.0	39.9	8.1	10.0	11.3	
2	Purina Pig & Hog Chow	Purina Mills	7.9	35.4	31.0	5.6	3.0	33.9	8.8	10.0	8.4	
2	Wirthmore Pig & Hog A Growing and Fattening Feed	St. Albans Grain Co.	10.1	18.0	17.0	4.5	4.0	56.0	5.2	9.0	5.2	
<b>Calf Meals.</b>												
2	Wayne Calf Meal	Allied Mills, Inc.	8.9	24.8	24.0	4.1	4.0	49.9	5.2	7.0	6.1	
1	Blatchford's Calf Meal	Blatchford Calf Meal Co.	8.8	26.1	24.0	4.7	5.0	47.6	6.1	6.75	6.7	
1	D. & G. Calf Meal	Dietrich & Gambrell, Inc.	8.6	25.8	21.0	4.3	4.0	52.9	3.3	3.5	5.1	
1	Eastern States Calf Starter	Eastern States Farmers' Exchange	10.2	25.7	23.0	5.1	3.5	50.1	3.2	4.0	5.7	
1	Eshelman Red Rose Calf Starter	John W. Eshelman & Sons	9.9	25.9	20.0	4.4	3.0	52.9	3.9	5.0	3.0	
2	Larroe Calf Meal	Larroe Milling Co.	8.5	25.3	23.0	4.2	4.0	54.0	2.5	4.0	5.5	
1	B. B. Bull Brand Calf Meal	Maritime Milling Co., Inc.	9.0	25.7	22.0	4.3	4.0	53.2	3.1	5.0	4.7	
1	Wirthmore Calf Meal	St. Albans Grain Co.	9.7	23.8	24.0	5.1	5.5	52.3	3.2	4.0	5.9	
1	Tioga Calf Food	Tioga-Empire Feed Mills, Inc.	10.8	24.7	21.0	5.3	4.0	46.0	6.7	7.0	6.5	

(b) Starchy Feeds.

<b>Fitting Rations.</b>												
2	Amco 12% Fitting Ration	Allied Mills, Inc.	10.4	13.1	12.0		4.8	3.0	60.2	5.3	9.0	6.2
1	Profit-Maker Fitting Ration	Associated Farmers' Exchanges, Inc.	11.1	14.2	12.0		5.0	4.0	59.4	5.0	7.0	5.3
3	Eastern States Fitting Ration	Eastern States Farmers' Exchange	10.9	13.9	12.0		4.3	3.5	60.2	5.5	7.0	5.2
1	Red Rose Fitting Ration	John W. Eshelman & Sons	8.7	15.5	12.0		4.7	3.5	59.3	6.4	7.0	5.4
3	Purina Fitting Chow	Purina Mills	9.2	16.7	13.5		4.1	2.6	54.6	10.1	12.0	5.3
2	Utility Pasture Ration	St. Albans Grain Co.	8.4	16.4	14.0		3.5	3.0	53.5	11.2	7.0	5.3
3	Wirthmore 14 Fitting Ration	St. Albans Grain Co.	9.3	16.2	14.0		4.1	4.0	57.5	7.3	7.0	5.6
5	Hygrade 14 Fitting Ration	St. Albans Grain Co.	9.6	17.2	14.0		4.6	4.5	56.8	6.1	8.5	5.8
1	Hygrade Fitting Ration	St. Albans Grain Co.	10.6	15.9	12.0		4.2	4.5	59.1	6.4	8.0	4.8
1	United Farmers Fitting Ration	United Co-Operative Farmers, Inc.	10.5	14.2	12.0		4.4	3.5	57.4	6.5	7.0	7.0

## Stock and Horse Feeds (less than 10 per cent fiber).

1	Wonder Horse & Mule Feed	8.9	11.9	9.0	3.8	3.0	67.8	5.4	10.0	2.2
1	Pennant Brand Stock Feed	9.4	10.7	9.5	4.8	4.0	62.3	9.2	9.5	3.6
1	Community Brand Stock Feed	7.1	10.4	9.5	5.4	3.25	63.2	9.9	12.0	4.0
1	King Stock Feed	7.6	10.5	9.0	5.9	4.0	64.6	7.9	9.5	3.9
1	Gambrell's Stock Feed	10.0	14.9	10.0	3.4	3.25	59.1	10.0	12.0	4.7
1	Frederick Stock Feed	9.6	8.6	7.5	3.4	3.0	65.9	10.0	12.0	2.5
1	Eastern Stock Feed	9.0	9.8	9.0	5.5	4.0	61.4	9.1	9.5	5.2
1	Eshelman Red Rose Stock Feed	7.8	10.4	9.0	4.3	3.0	64.8	9.0	11.0	3.7
1	White Stock Feed	9.6	11.3	8.0	6.0	3.0	59.2	9.5	14.0	4.4
1	Grandin's Stock Food	7.6	10.3	8.5	5.1	4.0	62.8	9.8	12.0	4.4
1	H. & H. White Stock Feed	8.5	12.1	10.0	4.4	2.5	62.7	8.0	12.0	4.3
2	B B Bull Brand Stock Feed	8.2	10.7	9.0	5.8	3.5	62.4	9.4	12.0	3.5
1	B B Hi-Test Stock Feed Sweetened	11.0	9.2	9.0	4.0	3.0	61.8	9.6	12.0	4.4
1	Uncle John's Stock Feed with Molasses									
1	Park & Pollard Stock Feed	8.5	12.1	10.0	4.4	3.0	64.5	7.1	12.0	3.4
1	Quaker Schumacher Feed	7.6	9.7	8.5	5.3	4.0	62.4	9.9	12.0	5.1
1	Quaker Oats Co.	7.2	12.6	10.0	3.9	3.0	61.4	10.0	12.0	4.9
8	Wirthmore Stock Feed	8.4	10.2	9.0	5.7	4.0	62.6	7.9	9.5	5.2
1	Syracuse Stock Feed	9.3	11.2	9.0	5.0	3.0	61.8	8.7	12.0	4.0
1	"Made-Right" White Stock Feed	9.0	10.9	9.0	5.4	4.0	62.7	8.6	10.0	3.5
1	Blue Seal Stock Feed	8.9	12.6	8.5	5.8	3.5	57.9	8.3	11.0	6.5
1	Wood's Stock Feed	7.9	11.8	8.0	4.1	3.5	61.5	8.6	12.0	6.1

## Stock and Horse Feeds (10 to 12 per cent fiber).

2	Courcy's Stock Feed	9.0	14.0	10.0	3.7	3.0	57.8	10.7	12.0	4.8
1	Coweco Stock Feed	6.7	9.9	9.0	5.0	4.0	61.4	11.5	11.0	5.5
1	Crystal Brand Stock Feed	7.3	13.8	12.0	4.6	4.0	56.4	11.8	12.0	6.1
1	Frederick Stock Feed	8.9	9.5	7.5	4.4	3.0	61.4	10.0	12.0	5.8
1	Eastern Stock Feed	6.9	9.8	9.0	4.8	4.0	64.3	10.5	9.5	3.7
4	Elmore Stock Feed	7.8	10.9	10.0	6.2	3.0	60.8	10.3	12.0	4.0
6	Quality Stock Feed	8.2	11.4	9.0	4.1	3.0	61.4	10.9	12.0	4.0
1	Red Tag A Chop Feed	9.6	9.8	7.0	4.0	3.0	59.8	11.2	14.0	5.6
1	Grandin's Stock Food	8.5	10.3	8.5	5.2	4.0	61.0	10.9	12.0	4.1
1	B B Hi-Test Stock Feed Sweetened	4.0	8.9	9.0	3.9	3.0	63.1	10.2	12.0	9.9
1	Park & Pollard Stock Feed	7.7	10.0	8.5	6.4	4.0	58.2	11.8	12.0	5.9
1	Quaker Schumacher Feed	8.5	11.9	10.0	5.0	3.0	60.5	11.5	12.0	4.7
3	Quaker Sugared Schumacher Feed	7.3	11.2	10.0	4.4	3.0	60.5	11.4	12.0	5.2
2	Williams' Stock Feed	9.2	11.2	10.0	3.7	3.0	61.1	11.0	12.0	3.8
1	Wood's Stock Feed	7.6	9.5	8.0	3.1	3.5	62.3	10.8	12.0	6.7

## Stock and Horse Feeds (more than 12 per cent fiber).

1	Delaware White Stock Feed	8.6	11.3	9.0	3.8	3.0	58.7	12.8	12.0	4.8
1	Eastern Stock Feed	8.3	9.2	9.0	6.3	4.0	58.5	13.3	9.5	4.4
1	Quality Stock Feed	7.7	10.9	9.0	3.8	3.0	61.5	12.1	12.0	4.0
1	Park & Pollard Stock Feed	8.7	9.3	8.5	5.8	4.0	59.0	12.1	12.0	5.1
1	Stratton's "24" Stock Feed	7.7	8.8	7.5	4.4	2.83	63.1	12.2	14.43	3.8

Complete Average Analyses of Feeds Collected (Per Cent)—Continued.  
 II. PREPARED FEEDS—Concluded.

(b) *Starchy Feeds*—Concluded

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Molasses Feeds (less than 15 per cent protein).</b>										
2	June Pasture	Allied Mills, Inc.	10.0	14.0	10.0	1.1	0.5	49.1	16.6	21.0	9.2
4	Wayne Supreme Horse Feed	Allied Mills, Inc.	9.6	11.3	9.5	3.7	3.5	66.4	6.2	8.0	2.8
1	Wonder Horse & Mule Feed	Arcady Farms Milling Co.	12.2	10.6	9.0	4.0	3.0	64.5	5.5	10.0	3.2
2	Profit-Maker Super Horse Feed	Associated Farmers' Exchanges, Inc.	10.8	11.6	9.0	3.6	3.5	63.1	7.6	9.0	3.3
1	Crystal Horse Feed	Curley Brothers	9.3	12.2	11.0	3.9	3.0	63.5	6.9	10.0	4.2
1	King Horse Feed	Cutler Co.	9.5	11.0	9.8	4.4	3.25	65.3	7.1	9.0	2.7
1	Delaware 85% Horse Feed	Delaware Mills, Inc.	10.0	10.6	9.0	4.1	3.0	64.5	7.4	10.0	3.4
3	Gambrell's Horse Feed	Dietrich & Gambrell, Inc.	9.3	10.9	10.0	3.6	3.5	66.7	6.5	12.0	3.0
1	Pen Mar Horse Feed	Dietrich & Gambrell, Inc.	9.3	11.3	10.0	4.0	3.0	66.6	6.0	11.0	3.4
3	Eastern States Horse and Cali Ration	Eastern States Farmers' Exchange	10.2	12.7	10.5	3.9	3.5	61.9	6.5	7.0	2.8
3	Elmore Horse Feed with Molasses	Elmore Milling Co., Inc.	9.5	10.5	9.0	4.1	2.5	68.0	5.5	11.0	4.8
2	Eshelman S-O-S	John W. Eshelman & Sons	10.9	13.4	11.0	2.6	2.0	52.5	15.4	15.0	2.4
3	Eshelmans Red Rose 85 Horse Feed	John W. Eshelman & Sons	7.1	11.4	9.0	4.0	3.0	65.6	6.2	10.0	2.7
1	Narragansett Indian 85% Horse Feed	Farm Service Stores, Inc.	10.7	11.7	9.0	3.2	3.0	61.4	9.6	10.0	3.4
1	Quality Horse Feed	Farm Service Stores, Inc.	7.5	11.8	8.0	4.4	2.0	65.0	7.9	9.0	3.4
1	Garland's Molasses Horse Feed	J. B. Garland & Son	10.5	10.2	10.0	2.5	2.5	64.4	9.3	10.0	3.1
1	Grandin's Sweetened Horse Feed	D. H. Grandin Milling Co.	10.1	11.8	9.5	3.9	3.5	66.5	4.7	11.0	3.0
1	Farmer Boy Horse Feed	J. B. Ham Co.	12.1	10.2	10.0	3.7	5.0	64.4	7.3	10.0	2.3
2	B B Bull Brand Horse Feed with Al- falfa and Molasses	Maritime Milling Co., Inc.	10.7	11.1	8.0	3.5	2.0	66.1	5.9	10.0	2.7
1	Domino Vim O Lene Horse Feed	Nowak Milling Corp.	8.1	11.1	9.5	4.0	3.0	66.8	7.4	9.0	2.6
2	Onto Horse Feed with Molasses	Ontario Milling Co., Inc.	9.9	12.7	10.0	4.1	3.2	63.2	6.5	10.0	3.6
3	Park & Pollard Horse Feed	Park & Pollard Co.	8.3	12.5	10.0	4.4	3.5	62.3	7.8	9.0	3.5
2	P. & P. Horse Feed with Alfalfa	Park & Pollard Co.	8.3	12.2	10.0	4.3	3.5	61.2	10.3	11.0	3.7
4	Purina Omolene Chow	Purina Mills	10.1	12.0	10.0	4.4	3.2	63.3	7.0	9.0	3.2
3	Purina Bulky Las Chow (Buffalo Mill)	Purina Mills	9.3	13.8	9.0	3.1	1.3	55.9	12.5	15.0	5.4
1	Protena Sweet Roughage Feed (Buf- falo Mill)	Purina Mills	9.0	10.0	6.0	1.7	1.0	52.5	19.3	30.0	7.5
2	Quaker Thorbred Horse Feed	Quaker Oats Co.	11.5	11.3	10.5	3.5	3.5	65.7	5.4	8.0	2.6



## III. POULTRY FEEDS.

6	Wirthmore Horse Feed . . . . .	St. Albans Grain Co. . . . .	10.5	10.7	9.8	4.1	3.25	65.4	6.3	9.0	3.0
1	Wirthmore Fodder Greens . . . . .	St. Albans Grain Co. . . . .	10.7	13.2	9.0	2.6	1.25	56.5	12.3	19.0	4.7
1	Neverfail Horse Feed . . . . .	Tioaga-Empire Feed Mills, Inc. . . . .	11.6	11.4	10.0	3.8	3.5	64.7	5.8	10.0	2.7
1	United Farmers Horse Feed . . . . .	United Co-Operative Farmers, Inc. . . . .	10.0	12.2	10.5	4.0	3.5	63.6	6.5	6.5	3.7
1	Blue Seal Horse Feed . . . . .	H. K. Webster Co. . . . .	11.2	11.9	10.5	4.5	3.5	64.2	4.4	7.5	3.8
1	Pure Feed Horse Ration . . . . .	West-Nesbitt, Inc. . . . .	11.4	11.8	9.0	3.5	3.0	64.8	6.4	10.0	2.1
<b>Miscellaneous Mixtures.</b>											
1	Ground Oats & Oat Feed or Banner Feed . . . . .	F. Diehl & Son, Inc. . . . .	7.2	13.5	6.0	5.9	2.0	55.5	13.2	30.0	4.7
1	Eshelman Red Rose Corn Feed Meal . . . . .	John W. Eshelman & Sons . . . . .	11.2	9.4	8.0	4.5	3.0	72.5	1.2	4.0	1.2
1	Jersey Milk Food Compound . . . . .	Jersee Co. . . . .	11.1	18.8	18.0	3.9	4.0	62.3	0.8	2.0	3.1
2	Banner Feed . . . . .	Quaker Oats Co. . . . .	5.8	13.8	13.0	4.7	4.5	51.8	17.5	18.0	6.4
3	"Made Right" Mixed Feed . . . . .	C. P. Washburn Co. . . . .	9.8	16.9	15.0	3.9	4.0	56.8	7.4	8.0	5.2

<b>Alfalfa Leaf Meal.</b>											
1	Leafalfa Brand . . . . .	A. B. Caple Co. . . . .	7.8	22.9	20.0	2.8	2.5	41.9	13.0	18.0	11.6
7	Fernando Ideal Greens Suncured . . . . .	Denver Alfalfa Milling & Products Co. . . . .	7.5	21.2	20.0	2.5	1.5	42.4	15.8	18.0	10.6
1	Peevee . . . . .	Fernando Valley Milling & Supply Co. . . . .	7.6	20.6	20.0	3.2	3.0	45.2	15.1	18.0	8.3
4		Pecos Valley Alfalfa Mill Co. . . . .	7.7	22.0	20.0	2.5	2.5	41.3	15.4	18.0	11.1
<b>Alfalfa Meal.</b>											
5	Fernando Ideal Greens Suncured . . . . .	A. B. Caple Co. . . . .	7.4	15.0	13.0	1.9	1.0	41.2	27.9	33.0	6.6
2	A-1 . . . . .	Fernando Valley Milling & Supply Co. . . . .	6.9	18.5	20.0	2.5	3.0	41.9	20.0	18.0	10.2
1	Sunshine Brand . . . . .	Ward Mooring . . . . .	7.3	20.0	20.0	2.8	2.5	39.8	18.2	18.0	11.9
1	Peevee . . . . .	Louis E. Page . . . . .	6.7	11.4	10.0	1.1	—	44.7	29.8	36.0	6.3
2	Velvet Meal . . . . .	Pecos Valley Alfalfa Mill Co. . . . .	7.8	19.8	20.0	3.1	2.5	38.8	21.6	18.0	8.9
1	Pecos . . . . .	Pecos Valley Alfalfa Mill Co. . . . .	9.5	18.2	17.0	2.2	1.5	42.0	18.7	23.0	9.4
1		Pecos Valley Alfalfa Mill Co. . . . .	6.7	13.0	13.0	1.8	1.5	40.8	31.4	33.0	6.3
<b>Alfalfa Stem Meal.</b>											
1		A. B. Caple Co. . . . .	8.4	12.3	13.0	1.6	1.0	37.1	34.8	33.0	5.8
<b>Feeding Oatmeal.</b>											
3	Alpine . . . . .	J. A. Forrest . . . . .	8.8	16.5	14.0	3.6	5.0	64.2	4.3	3.9	2.6
3	Gold Medal Fine Ground . . . . .	Northern Illinois Cereal Co. . . . .	7.8	15.9	15.5	7.9	6.0	65.3	1.2	3.0	1.9
2	North Star . . . . .	Quaker Oats Co. . . . .	7.6	16.6	16.0	6.6	6.0	65.1	2.1	2.0	2.0



Complete Average Analyses of Feeds Collected (Per Cent)—Continued.  
 III. POULTRY FEEDS—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
Chick Starting and Growing Feeds.											
3	Wayne All Mash Chick Starter with Cod Liver Oil and Sardine Oil	Allied Mills, Inc.	9.2	18.4	17.0	4.8	4.0	55.5	4.4	6.0	7.7
3	Wayne All Mash Grower.	Allied Mills, Inc.	9.0	16.5	16.0	4.9	4.0	58.2	4.3	6.0	7.1
1	Wayne All Mash Grower with Cod Liver Oil and Sardine Oil	Allied Mills, Inc.	8.8	17.3	16.0	5.0	4.0	57.5	4.2	6.0	7.2
1	Wayne Turkey Mash.	Allied Mills, Inc.	9.5	16.8	15.0	5.0	3.5	54.3	7.7	8.0	6.7
2	Ames Growing Mash	A. P. Ames Co.	7.6	19.1	18.0	5.7	5.0	54.2	4.9	5.0	8.5
1	Ames Starter & Broiler Ration	A. P. Ames Co.	8.0	18.5	17.5	5.2	4.0	56.1	4.6	5.0	7.6
1	Wonder Complete Broiler Ration	Arcady Farms Milling Co.	7.1	18.0	17.0	5.8	4.0	56.1	5.2	5.0	7.8
3	Arcady Besbet Growing Mash	Arcady Farms Milling Co.	9.4	16.1	16.0	5.1	4.0	55.4	6.3	7.5	7.7
1	Arcady Besbet Starting Mash	Arcady Farms Milling Co.	9.9	14.2	13.0	5.0	3.5	59.1	5.4	6.0	6.4
1	Profit-Maker Starting and Growing Mash.	Associated Farmers' Exchanges, Inc.	8.9	18.7	16.5	4.4	4.0	57.5	4.1	6.0	6.4
1	Beacon Turkey Starter	Beacon Milling Co., Inc.	9.4	20.1	20.0	5.1	4.0	54.9	4.2	6.0	6.3
1	Beacon Complete Starting Ration	Beacon Milling Co., Inc.	9.2	18.9	17.5	4.5	4.0	55.0	4.1	6.0	8.3
1	Beacon Turkey Growing Feed	Beacon Milling Co., Inc.	8.9	20.5	17.0	5.3	4.0	51.8	5.3	7.0	8.2
1	Chariot Starter & Grower	Beacon Milling Co., Inc.	8.3	17.6	16.0	4.9	4.0	55.0	5.1	7.0	9.1
4	Beacon's Cayuga Growing Mash	Beacon Milling Co., Inc.	8.8	17.9	16.0	5.2	4.0	54.3	5.6	7.0	8.2
1	Community Chick Mash (Starter-grower-broiler)	Community Feed Stores, Inc.	9.5	18.7	17.0	4.8	5.0	53.8	6.0	8.0	7.2
2	Eastern Starting Feed	Nicolas Courcy	8.6	18.9	17.0	5.2	5.0	56.0	3.8	5.0	7.5
1	Courcy's Growing Feed	Nicolas Courcy	8.0	19.4	17.0	4.9	4.0	53.1	4.5	5.0	10.1
2	Coweco Growing Mash	E. A. Cowee Co.	8.3	18.0	14.0	6.6	4.5	55.6	4.0	6.0	7.5
1	Crystal Growing Mash	Curley Brothers	7.7	17.5	16.0	5.5	5.0	57.9	4.5	5.0	6.9
1	Crystal Starting Food for Broilers	Curley Brothers	7.6	18.2	16.0	5.1	4.0	59.8	3.0	4.5	6.3
1	Crystal All Grain Starting Food	Curley Brothers	8.2	17.8	15.0	4.5	5.0	60.4	3.0	4.0	6.1
1	King Baby Chick Starter	Cutler Co.	8.8	19.4	18.0	4.3	4.0	59.1	2.9	5.0	5.5
1	King All Purpose Chick and Broiler Ration	Cutler Co.	7.9	19.9	17.5	4.4	4.0	58.8	3.2	5.5	5.8
1	King Growing Feed Containing Buttermilk	Cutler Co.	8.1	18.0	15.0	4.7	4.5	57.5	4.7	6.0	7.0
1	Delaware Growing Mash (with Dried Skim Milk)	Delaware Mills, Inc..	8.8	17.4	17.0	5.5	5.0	58.2	4.3	6.0	5.8



Complete Average Analyses of Feeds Collected (Per Cent)—Continued.  
 III. POULTRY FEEDS—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.		Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.			Found.	Guar- anteed.	
	<b>Chick Starting and Growing Feeds—Concluded.</b>											
1	Red Comb Chick Starter with Dried Buttermilk . . . . .	Hales & Hunter Co. . . . .	9.6	18.4	15.0	4.9	4.0	54.9		4.6	5.0	7.6
1	Larroe Turkey and Game Bird Developer . . . . .	Larroe Milling Co. . . . .	9.5	18.8	18.5	6.2	4.5	48.7		6.5	6.5	10.3
1	Larroe Chick Starter . . . . .	Larroe Milling Co. . . . .	8.8	17.7	16.5	5.0	4.5	57.6		3.8	5.0	7.1
2	Larroe Growing Mash . . . . .	Larroe Milling Co. . . . .	10.1	17.5	16.0	4.9	4.5	55.8		4.8	6.5	6.9
2	"Mansfield" Chick-Growing-Feed . . . . .	Mansfield Milling Co. . . . .	9.1	21.9	17.0	5.5	4.0	50.7		6.4	8.0	6.4
1	Vitaminized B B Bull Brand Growing Mash . . . . .	Maritime Milling Co., Inc. . . . .	9.8	15.8	16.0	6.0	4.5	56.4		4.7	7.0	7.3
1	B B Bull Brand All Mash Broiler Growing Ration . . . . .	Maritime Milling Co., Inc. . . . .	9.5	16.4	15.0	5.8	4.0	55.6		5.2	7.0	7.5
1	B B Bull Brand All Mash Chick Starter Ration . . . . .	Maritime Milling Co., Inc. . . . .	7.5	18.1	17.0	6.2	4.0	57.8		4.5	6.0	5.9
3	B B Daisy All Mash Starting & Growing Feed . . . . .	Maritime Milling Co., Inc. . . . .	8.7	16.9	15.0	5.4	3.5	56.3		5.9	7.0	6.8
2	Dollar Maker Growing Mash Vita- minized with Cod Liver Oil . . . . .	Maritime Milling Co., Inc. . . . .	8.2	16.4	15.0	6.0	3.5	56.8		5.9	9.0	6.7
1	Moon's Baby Chick Starter Mash . . . . .	Geo. Q. Moon & Co., Inc. . . . .	8.2	16.9	15.0	4.0	4.0	55.9		3.8	5.0	11.2
1	Aunt Mary's Growing Mash with Dried Buttermilk . . . . .	Ontario Milling Co., Inc. . . . .	9.0	17.8	17.0	4.7	4.0	55.3		5.6	8.0	7.6
1	Aunt Mary's Growing Mash with Dried Buttermilk & Cod Liver Oil . . . . .	Ontario Milling Co., Inc. . . . .	9.6	17.6	17.0	4.4	4.0	53.5		6.0	8.0	8.9
1	Park & Pollard Chick Starter . . . . .	Park & Pollard Co. . . . .	8.7	17.5	17.0	5.2	3.5	60.0		3.0	5.0	5.6
1	All-In-One Starting Feed . . . . .	Park & Pollard Co. . . . .	7.9	18.6	17.0	4.5	3.5	58.3		3.6	5.0	7.1
1	Park & Pollard Turkey Grower . . . . .	Park & Pollard Co. . . . .	8.1	18.0	15.0	4.5	3.0	58.0		4.2	7.0	7.2
3	Growing Feed . . . . .	Park & Pollard Co. . . . .	9.9	16.7	14.0	4.5	3.0	58.1		4.8	7.0	6.0
2	Egg-Em-On Growing Feed . . . . .	H. C. Puffer Co. . . . .	8.9	19.6	16.0	5.3	4.0	54.8		4.8	7.0	6.6
1	Purina All Mash Starlena Chow . . . . .	Purina Mills . . . . .	7.9	21.5	18.0	5.4	4.0	52.9		4.6	7.0	7.7
2	Purina Chick Growena Chow . . . . .	Purina Mills . . . . .	8.6	19.0	17.0	4.8	3.5	54.7		6.2	7.0	6.7
1	Purina Turkey Growing and Fatten- ing Chow . . . . .	Purina Mills . . . . .	10.4	22.2	17.0	4.8	2.5	50.3		5.0	8.0	7.3

[illegible]

Complete Average Analyses of Feeds Collected (Per Cent)—Continued.  
 III. POULTRY FEEDS—Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Laying Mash</b> es—Continued.										
1	King Mash Feed containing Butter- milk	Cutler Co.	8.6	21.4	20.0	4.5	4.0	54.3	4.6	7.0	8.6
1	King Mash Feed containing Cod Liver Oil — Buttermilk	Cutler Co.	8.7	22.5	20.0	4.9	4.0	49.9	4.7	7.0	8.3
1	Indian Laying Mash (with Dried Skim Milk)	Delaware Mills, Inc.	8.4	19.1	18.0	4.8	5.0	53.7	6.5	7.0	7.5
1	Delaware All Mash Laying Food	Delaware Mills, Inc.	10.0	17.0	15.0	6.0	4.0	54.0	5.4	6.0	7.6
3	Diauto's Special Egg Mash	Frank Diauto	9.6	18.2	17.0	5.2	4.0	56.5	3.4	5.0	7.1
1	Dickinson's Globe Egg Mash	Albert Dickinson Co.	8.9	21.5	20.0	6.0	4.0	49.9	4.4	6.0	9.3
1	Diehl's Dry Mash	F. Diehl & Son, Inc.	7.6	25.2	16.0	5.0	3.0	49.7	6.2	12.0	6.3
1	Gambrell's Laying Mash	Dietrich & Gambrell, Inc.	7.9	22.5	20.0	5.5	5.0	49.7	5.4	7.0	9.0
1	D. & G. Turkey Mash	Dietrich & Gambrell, Inc.	7.9	22.4	20.0	6.2	4.0	46.1	5.6	12.0	11.8
1	Frederick Laying Mash	J. L. Dunnell & Son	8.5	19.7	18.0	5.3	3.5	53.0	5.7	8.0	7.6
5	Excel Mash	East Bridgewater Farmers' Exchange, Inc.	7.6	23.2	19.0	4.9	5.0	49.5	5.0	6.0	9.8
1	Special Mash Feed	Eastern States Farmers' Exchange	10.3	18.0	18.0	4.9	5.0	56.5	4.0	5.0	6.3
1	Eastern States Milk Egg Mash	Eastern States Farmers' Exchange	9.6	19.5	17.0	4.7	4.0	54.1	5.2	6.5	6.9
1	Eastern States Producer Mash	Eastern States Farmers' Exchange	7.0	19.4	17.0	5.0	4.0	55.1	5.1	6.5	8.4
1	Eastern States Mash with Oil	Eastern States Farmers' Exchange	8.5	18.2	17.0	5.7	4.0	54.5	4.6	6.5	8.5
2	The Ellis Poultry Mash	M. W. Ellis	7.7	22.6	20.0	5.2	4.0	48.6	5.2	8.0	10.7
4	Elmore Egg Mash	Elmore Milling Co., Inc.	8.3	20.9	18.0	6.4	4.0	51.4	5.1	8.0	7.9
1	R-Own Egg Mash	Elmore Milling Co., Inc.	8.4	20.9	18.0	5.4	4.0	47.7	7.7	9.0	9.9
2	Elmore Eggmaker	Elmore Milling Co., Inc.	9.3	19.2	17.0	6.6	4.5	51.9	5.4	8.0	7.6
3	Eshelman Red Rose Laying Mash	John W. Eshelman & Sons	9.4	22.9	20.0	6.2	5.0	48.2	5.6	7.0	7.7
2	Red Rose Laying Mash with Cod Liver Oil	John W. Eshelman & Sons	8.6	22.0	20.0	6.8	5.0	49.6	5.4	7.0	7.6
5	Narragansett Indian Egg Mash	Farm Service Stores, Inc.	9.1	21.3	20.0	5.3	5.0	47.1	4.8	7.0	12.4
2	Quality Laying Mash	Farm Service Stores, Inc.	8.5	21.7	20.0	5.3	5.0	47.0	6.4	7.0	11.1
4	Big C Mash	Farm Service Stores, Inc.	9.3	20.1	19.0	5.1	4.5	51.6	5.8	8.0	8.1
2	Flory's Egg Mash with Cod Liver Oil	Flory Milling Co., Inc.	9.3	22.8	20.0	4.9	4.5	49.4	5.6	6.0	8.0

Golden Egg Laying Mash	Flory Milling Co., Inc.	9.3	21.7	20.0	4.5	4.0	51.6	5.8	7.0	7.1
Golden Egg Laying Mash with Cod Liver Oil	Flory Milling Co., Inc.	9.1	21.7	20.0	5.2	4.0	49.3	6.9	7.0	7.8
Sunray Laying Mash	Flory Milling Co., Inc.	9.0	20.8	18.0	4.8	4.0	50.0	7.7	10.0	7.7
Fountain's Buttermilk Laying Mash	Fred A. Fountain	9.4	20.9	17.0	4.8	4.5	51.0	4.3	7.0	9.6
Special Mash or Poultry Feed	Dean S. French	8.8	21.1	20.0	5.5	4.5	48.3	6.0	8.0	10.3
Garland's Poultry Mash	J. B. Garland & Son	9.2	21.3	20.0	5.4	4.0	50.0	5.1	8.0	9.0
Gold Medal Egg Mash for Breeding and Laying with Dried Buttermilk	General Mills, Inc.	9.4	21.5	20.0	5.4	5.5	51.6	5.0	7.0	7.1
Neponset Poultry Mash with Milk	W. K. Gilmore & Sons, Inc.	8.2	22.8	20.0	5.4	3.0	46.8	3.3	10.0	11.5
Storrs World's Record Laying Mash	Frank A. Goode	8.0	18.8	17.0	5.4	4.0	54.6	5.3	6.5	7.9
Grandin's Laying Mash with Buttermilk	D. H. Grandin	8.2	22.3	20.0	5.3	4.0	48.0	5.4	8.0	10.8
Grandin's Poultry Green Food	D. H. Grandin Milling Co.	10.4	13.0	10.0	1.5	1.0	46.7	21.5	25.0	6.9
Daily Egg Mash Feed	Great Atlantic & Pacific Tea Co.	9.5	21.1	20.0	5.1	4.5	49.7	5.6	7.0	9.0
Morning Glory Egg Mash with Dried Buttermilk	Hales & Hunter Co.	8.0	21.0	20.0	5.7	4.5	49.6	6.0	8.0	9.7
Red Comb Egg Mash with Dried Buttermilk	Hales & Hunter Co.	8.2	20.7	18.0	6.8	4.0	49.5	6.1	7.0	8.7
Farmer Boy Egg Mash with Dried Skim Milk and Cod Liver Oil	J. B. Ham Co.	8.9	19.4	18.0	4.9	5.0	54.7	4.7	7.0	7.4
Hamco Egg Mash with Dried Skim Milk and Cod Liver Oil	J. B. Ham Co.	8.1	18.2	17.0	5.3	4.0	57.0	4.5	6.5	6.9
Make-M-Lay Laying Mash	Horvitz Grain Co.	9.8	21.5	20.0	5.7	5.0	49.4	6.0	9.0	7.6
Open Formula Mash	Horvitz Grain Co.	10.0	17.7	17.0	4.8	4.5	52.6	6.2	7.0	8.7
Ideal Poultry Mash	R. B. Howlett	10.3	19.8	15.0	5.0	4.0	53.0	5.3	10.0	6.6
Just Right Egg Mash	Jersee Co.	10.0	20.8	18.0	5.1	5.0	48.6	8.0	8.0	8.5
Larroe Egg Mash	Larroe Milling Co.	8.1	20.3	19.0	5.6	5.0	50.9	5.4	7.5	9.7
Mansfield Dry-Poultry-Mash	Mansfield Milling Co.	8.9	23.9	22.0	6.2	5.0	47.8	5.0	7.0	8.2
B B B Red Egg Mash Vitaminized with Cod Liver Oil and Dried Buttermilk	Maritime Milling Co., Inc.	9.3	20.5	20.0	6.2	4.0	50.1	5.6	7.0	8.3
B B Daisy Egg Mash with Dried Buttermilk	Maritime Milling Co., Inc.	8.5	20.0	18.0	5.7	3.5	52.1	5.7	7.0	8.0
Dollar Maker Egg Mash Vitaminized with Cod Liver Oil	Maritime Milling Co., Inc.	9.7	18.2	17.0	5.9	3.5	52.0	6.8	9.0	7.4
Vitaminized B B Bull Brand Control Mash with Milk Sugar Feed and Dried Buttermilk	Maritime Milling Co., Inc.	9.4	16.3	14.0	3.4	2.5	50.6	2.8	4.0	8.5
Macvo Laying Mash	Matheson Vail Co.	7.8	19.1	17.0	5.5	4.0	53.6	3.5	6.5	8.5
Moon's Special A Laying Mash with Dried Buttermilk & Oil	Geo. Q. Moon & Co., Inc.	9.2	19.7	18.0	6.2	5.0	48.3	4.7	9.0	11.9
Aunt Mary's Laying Mash with Cod Liver Oil	Ontario Milling Co., Inc.	8.3	20.6	19.0	5.0	4.0	50.8	7.0	8.5	8.3

## Complete Average Analyses of Feeds Collected (Per Cent)—Continued.

## III. POULTRY FEEDS—Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.		Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Laying Mash</b> —Concluded.											
4	Oswego Laying Mash . . . . .	Ontario Milling Co., Inc. . . . .	8.8	20.3	18.0	4.0	4.9	4.0	52.1	6.3	8.5	7.6
2	Lay or Bust Dry Mash . . . . .	Park & Pollard Co. . . . .	9.7	20.5	18.0	3.0	4.7	3.0	52.9	5.3	7.0	6.9
3	Lay or Bust Dry-Mash with Cod Liver Oil . . . . .	Park & Pollard Co. . . . .	10.0	20.7	18.0	3.0	4.7	3.0	53.2	5.2	7.0	6.2
1	Parker's Egg Mash . . . . .	George H. Parker Grain Co. . . . .	6.8	19.5	18.0	5.0	5.3	5.0	51.5	5.2	7.0	10.5
2	Egg-Em-On Laying Mash . . . . .	H. C. Puffer Co. . . . .	9.0	22.2	20.0	4.6	4.6	4.6	49.5	5.9	9.0	8.8
3	Purina Breeder Egg Chowder . . . . .	Purina Mills . . . . .	8.7	21.5	19.0	3.5	5.0	3.5	49.5	6.5	8.0	8.4
2	Purina Lay Chow . . . . .	Purina Mills . . . . .	9.5	19.2	17.0	2.5	5.0	2.5	52.3	6.4	7.6	7.6
2	Purina Lay Chow (with Dried Buttermilk) . . . . .	Purina Mills . . . . .	9.5	19.3	17.0	2.5	4.7	2.5	53.8	5.9	8.0	6.8
2	Purina All Mash Egg Chowder . . . . .	Purina Mills . . . . .	8.7	16.9	15.5	3.5	5.0	3.5	55.4	5.3	8.0	8.7
4	Quaker Ful-O-Pep Egg Mash . . . . .	Quaker Oats Co. . . . .	7.6	20.8	20.0	4.5	6.0	4.5	52.3	5.4	8.0	7.9
1	Ropes Poultry Hash . . . . .	Reuben W. Ropes . . . . .	7.1	19.1	17.0	5.0	5.5	5.0	52.4	7.4	10.0	8.5
1	Minot Poultry Mash . . . . .	Ryther & Warren . . . . .	9.4	19.3	18.0	4.0	5.8	4.0	50.5	5.8	8.0	9.2
1	Minot Milk Egg Mash . . . . .	Ryther & Warren . . . . .	9.4	18.5	17.0	3.8	5.9	3.8	54.2	5.1	7.0	6.9
1	Wirthmore Breeder Mash . . . . .	St. Albans Grain Co. . . . .	7.2	22.1	20.0	4.1	4.5	4.5	53.8	5.5	7.0	7.3
2	Wirthmore Laying Mash . . . . .	St. Albans Grain Co. . . . .	8.1	22.5	20.0	4.0	4.6	4.0	51.8	4.8	7.0	8.2
4	Wirthmore Laying Mash (Containing Fortified Cod Liver Oil) . . . . .	St. Albans Grain Co. . . . .	9.0	21.7	20.0	4.0	4.8	4.0	51.5	4.7	7.0	8.3
1	Wirthmore Complete Ration for Layers . . . . .	St. Albans Grain Co. . . . .	9.3	17.3	15.0	4.4	4.4	4.0	60.5	3.3	5.0	5.2
2	Shea's Mash Feed . . . . .	John Shea . . . . .	8.2	21.8	18.0	4.9	4.9	4.0	48.0	6.5	8.0	10.6
1	Egaine, with Cod Liver Oil Added . . . . .	Tioga-Empire Feed Mills, Inc. . . . .	8.3	24.9	23.0	4.6	4.6	3.5	48.8	5.0	7.0	8.4
1	Tioga Laying Food . . . . .	Tioga-Empire Feed Mills, Inc. . . . .	9.7	20.1	18.0	5.2	5.2	5.0	53.3	5.5	7.5	6.2
1	Commercial Laying Mash . . . . .	Ubiko Milling Co. . . . .	7.4	19.5	18.0	5.2	5.2	5.0	54.5	5.6	8.0	7.8
1	Ubiko All-Mash Complete Laying Ration . . . . .	Ubiko Milling Co. . . . .	7.3	17.4	16.0	3.5	4.6	3.5	58.0	5.3	6.0	7.4
1	United Farmers Milk Egg Mash . . . . .	United Co-Operative Farmers, Inc. . . . .	9.9	17.4	16.5	4.0	5.6	4.0	53.2	5.1	6.5	8.8
1	"Made-Right" Dry Mash . . . . .	C. P. Washburn Co. . . . .	9.6	22.4	20.0	6.3	6.3	4.5	50.2	5.4	6.0	7.1
2	Blue Seal Laying Mash . . . . .	H. K. Webster Co. . . . .	8.6	20.8	20.0	5.0	5.0	3.5	52.2	5.2	6.0	8.2
2	Blue Seal Breeders' Mash . . . . .	H. K. Webster Co. . . . .	8.2	19.3	19.0	5.4	5.4	4.0	54.4	5.2	6.0	7.5
1	Blue Seal Milk Mash . . . . .	H. K. Webster Co. . . . .	8.0	20.2	16.5	5.7	5.7	4.5	51.4	5.5	6.0	9.2
2	Blue Seal Improved All-Mash Ration . . . . .	H. K. Webster Co. . . . .	10.2	14.8	15.0	4.8	4.8	4.5	61.8	3.0	4.0	5.4
2	Pure Feed Egg Maker . . . . .	West-Nesbitt, Inc. . . . .	9.0	21.9	18.0	4.6	4.6	4.0	53.9	4.6	7.0	6.0
1	Williams' Laying Mash . . . . .	Est. M. G. Williams . . . . .	8.5	18.5	16.0	5.2	5.2	4.0	53.4	5.6	7.0	8.8
3	Preferred Laying Mash . . . . .	Stanley Wood Grain Co. . . . .	9.0	19.3	16.0	4.5	4.6	4.5	51.9	4.7	7.0	10.5



**Fattening and Broiler Feeds.**

1	Wayne Broiler Ration	Allied Mills, Inc.	18.4	18.0	5.8	3.5	55.6	5.0	8.0	5.4
2	Wayne Poultry Fattener	Allied Mills, Inc.	16.2	13.5	5.0	4.0	61.8	4.7	7.0	3.0
1	Wonderful Station Feed	Arcady Farms Milling Co.	14.5	12.5	5.3	4.5	64.2	4.7	6.0	3.2
2	Beacon Fleshing Mash and Crate Fattener	Beacon Milling Co., Inc.	16.5	15.0	5.0	4.5	61.4	4.5	5.0	4.3
1	Gambrill's Fattening Mash	Dietrich & Gambrill, Inc.	17.7	14.0	5.0	4.8	61.4	2.9	5.0	3.9
1	Eastern All Purpose Chick and Broiler Ration	Eastern Grain Co.	19.9	17.5	4.7	4.0	55.6	4.2	5.5	5.4
1	Eastern States Turkey-Fat	Eastern States Farmers' Exchange	17.9	16.0	4.7	3.5	56.9	4.7	5.0	6.5
3	Elmore Complete Broiler Ration	Elmore Milling Co., Inc.	18.7	17.0	6.4	4.0	52.2	5.3	5.0	9.2
1	Flory's Broiler Mash	Flory Milling Co., Inc.	22.1	18.0	5.7	4.0	51.2	4.1	5.0	7.3
1	Red Comb Broiler Mash with Dried Buttermilk	Hales & Hunter Co.	19.4	18.0	4.9	4.0	53.6	5.0	7.0	8.3
1	Red Comb Crate Fattener with Rolled Oats	Hales & Hunter Co.	15.5	13.0	5.2	4.0	57.4	5.0	6.0	8.0
1	Larro Broiler Feed	Larroe Milling Co.	16.5	15.0	4.5	4.5	57.6	5.0	7.0	6.8
1	Purina Chicken Fatena Chow	Purina Mills	14.5	12.0	5.8	3.0	61.9	5.7	6.6	3.4
1	Wirthmore Fleshing and Fattening Mash	St. Albans Grain Co.	15.7	15.0	5.1	4.5	61.8	3.3	6.0	4.1
1	Blue Seal Broiler Ration	H. K. Webster Co.	17.9	16.5	5.7	4.0	57.4	4.5	4.5	5.8
<b>Chick Grains.</b>										
1	Wayne Chick Feed	Allied Mills, Inc.	12.0	9.0	3.3	2.0	70.1	1.3	4.0	1.9
1	Arcady Chick Grains	Arcady Farms Milling Co.	10.3	10.0	3.5	2.5	69.8	1.9	5.0	1.5
1	Beacon Chick Feed	Beacon Milling Co., Inc.	11.6	10.0	4.0	2.5	70.4	1.1	3.5	1.6
1	Crystal Baby Chick Grains	Curley Brothers	12.9	10.0	4.2	2.5	70.2	1.2	4.0	1.7
1	Dickinson's Globe Chick Scratch	Albert Dickinson Co.	12.3	10.0	2.8	2.5	70.1	1.5	3.75	1.7
1	Fredrick Chick Feed	Dietrich & Gambrill, Inc.	12.0	10.0	4.9	2.5	69.3	1.4	3.0	2.0
1	Narragansett Indian Chick Feed	Farm Service Stores, Inc.	13.3	10.0	3.5	2.0	71.1	1.5	2.0	1.3
1	Eventually Gold Medal Chick Feed	General Mills, Inc.	11.1	10.0	3.5	2.5	72.9	1.3	5.0	1.6
2	Grandin's Baby Chick Feed	D. H. Grandin Milling Co.	10.7	10.0	3.4	2.5	70.0	1.4	5.0	2.7
1	Wantmore Chick Feed	Horvitz Grain Co.	11.7	10.0	3.6	2.5	70.4	1.1	3.5	1.6
1	Larro Chick Grains	Larroe Milling Co.	11.4	10.0	3.2	2.0	72.5	1.5	3.5	1.4
1	Moon's Baby Chick Grain	Geo. Q. Moon Co., Inc.	11.5	10.0	1.2	3.0	73.4	0.8	2.5	0.8
1	Red Ribbon Chick Feed	Park & Pollard Co.	11.6	10.0	3.7	3.0	70.5	1.7	3.5	1.8
1	Quaker Ful-O-Pep Fine Chick Feed	Quaker Oats Co.	11.8	11.0	3.8	2.5	71.1	1.6	2.0	1.8
1	Wirthmore Baby Chick Scratch	St. Albans Grain Co.	13.1	10.0	3.9	2.5	70.8	1.5	3.5	1.3
<b>Rabbit Feeds.</b>										
1	Beacon Compress Rabbit Feed	Beacon Milling Co., Inc.	18.5	16.5	4.1	4.0	58.0	5.2	7.0	4.9
1	Eshelman's Red Rose Rabbit Feed	John W. Eshelman & Son	16.3	14.0	3.5	3.5	59.1	5.2	9.5	6.4
1	Flory's Rabbit Feed	Flory Milling Co., Inc.	14.7	13.0	3.9	3.0	58.6	6.5	7.0	6.2
3	Wirthmore Rabbit Ration	St. Albans Grain Co.	16.4	14.0	4.4	3.5	56.7	5.8	9.0	7.5



**Complete Average Analyses of Feeds Collected (Per Cent)—Continued.**  
**IV. ANIMAL PRODUCTS.**

Number of Samples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Protein.		Fat.		Phosphoric Acid.	Ash.
			Found.	Guaranteed.	Found.	Guaranteed.		
	<b>Meat.</b>							
1	Butcher's Special Poultry Food . . . . .	Butchers Rendering Co. . . . .	58.5	60.0	11.9	8.0	8.6	20.7
1	Corenco 50% Meat Scrap . . . . .	Consolidated Rendering Co. . . . .	52.0	50.0	9.7	6.0	9.7	26.9
1	Marsh's Gem Brand Scraps for Poultry . . . . .	Geo. E. Marsh Co. . . . .	48.9	45.0	10.7	10.0	8.8	32.9
1	Movan High Grade Meat Scraps . . . . .	Monti-Van Iderstine, Inc. . . . .	53.9	50.0	11.3	7.0	9.4	24.5
2	Morse's 55% Meat Scraps for Poultry . . . . .	Jas. F. Morse & Co. . . . .	57.7	55.0	13.6	8.0	7.7	20.1
2	Brighton Special Meat Scraps . . . . .	New England Rendering Co. . . . .	57.8	55.0	13.4	10.0	7.7	19.0
1	Steamed Meat & Bone for Poultry & Hogs . . . . .	N. Roy & Son . . . . .	54.6	50.0	12.4	8.0	9.6	24.8
2	Brightwood Special Poultry Food . . . . .	Springfield Rendering Co. . . . .	62.1	60.0	9.7	8.0	7.4	19.3
1	Vico Quality Meat & Bone Scraps . . . . .	Van Iderstine Co. . . . .	56.4	50.0	10.0	5.0	7.7	20.9
2	Special 55% Meat Scraps . . . . .	Worcester Rendering Co. . . . .	57.1	55.0	10.4	8.0	9.1	22.3
	<b>Meat and Bone.</b>							
3	Butchers 45 Poultry Feed . . . . .	Butchers Rendering Co. . . . .	49.2	45.0	10.7	8.0	12.3	30.9
1	Corenco 60% Meat Scrap . . . . .	Consolidated Rendering Co. . . . .	54.2	60.0	9.4	6.0	11.9	28.7
1	Corenco 45% Meat & Bone Scrap . . . . .	Consolidated Rendering Co. . . . .	46.7	45.0	9.4	6.0	11.0	35.6
1	Perfection Poultry Feed . . . . .	Lowell Rendering Co. . . . .	53.6	55.0	9.1	8.0	14.0	26.5
1	Premium Poultry Feed . . . . .	Lowell Rendering Co. . . . .	48.9	45.0	9.3	8.0	12.5	30.8
1	Marsh's Diamond Special Scraps for Poultry . . . . .	Geo. E. Marsh Co. . . . .	52.7	50.0	9.5	10.0	11.0	29.8
6	Morse's 50% Meat Scraps for Poultry . . . . .	Jas. F. Morse & Co. . . . .	53.1	50.0	10.8	8.0	10.0	26.8
1	Morse's 45% Meat Scraps for Poultry . . . . .	Jas. F. Morse & Co. . . . .	47.1	45.0	11.0	8.0	12.1	31.8
1	Brighton Bull Meat Scrap . . . . .	New England Rendering Co. . . . .	49.9	45.0	10.6	8.0	11.8	28.1
1	60% Register Brand Meat Scraps . . . . .	John Reardon & Sons Co. . . . .	59.8	60.0	8.3	6.0	13.1	23.4
2	50% Register Brand Meat & Bone Scraps . . . . .	John Reardon & Sons Co. . . . .	51.9	50.0	11.2	6.0	10.5	27.3
6	45% Register Brand Meat & Bone Scraps . . . . .	John Reardon & Sons Co. . . . .	46.1	45.0	10.1	6.0	14.0	34.9
2	Springfield High Grade Poultry Feed 50% . . . . .	Springfield Rendering Co. . . . .	51.1	50.0	9.9	8.0	11.6	31.2
3	Springfield Poultry Feed 45% . . . . .	Springfield Rendering Co. . . . .	45.8	45.0	8.6	8.0	13.8	34.8

**Bone Meal.**

Steamed Bone Meal . . . . .  
 Corenco Bone Meal . . . . .  
 Brighton Feeding Bone . . . . .  
 Rearco Edible Bone Meal for Feeding . . . . .  
 VICO Special Steamed Bone . . . . .

83.9  
 58.9  
 73.5  
 61.6  
 72.4

33.6  
 24.3  
 30.2  
 25.6  
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 3.0  
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0.6  
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5.0  
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 7.0  
 20.0  
 5.0

7.5  
 26.0  
 11.4  
 25.8  
 13.6

Bradley & Baker  
 Consolidated Rendering Co.  
 New England Rendering Co.  
 John Reardon & Sons Co.  
 Van Iderstine Co.

**Fish.**

CIC Cod Liver Meal . . . . .  
 Flag Fish Meal . . . . .  
 Gorton's Codfish Meal . . . . .  
 Sardine Maine Fish Meal . . . . .  
 Fish Meal for Poultry . . . . .  
 Boston Pure Cod & Haddock Meal . . . . .  
 Register Brand Cod & Haddock Fish Meal . . . . .  
 Wilpaco Pure Cod and Haddock Fish Meal . . . . .

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25.0  
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28.9  
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 64.1

Consumers Import Co., Inc.  
 Flag Fish Co., Inc.  
 Gorton-Pew Fisheries Co., Ltd.  
 Maine Fish Meal Co.  
 Jas. F. Morse & Co.  
 New England Rendering Co.  
 John Reardon & Sons Co.  
 Wilmington Packing Co.

**Milk Products.**

Buell-Boston Dried Skim Milk . . . . .  
 Burck Brand Powdered Skim Milk . . . . .  
 "Bison" Dried Skimmilk . . . . .  
 Dairylea Dried Skim Milk Powder . . . . .  
 Old Sol Dried Skim Milk . . . . .  
 Land O'Lakes Dried Skimmilk . . . . .  
 Surety Brand Powdered Skimmilk . . . . .  
 Ward's Pure Dried Skim Milk . . . . .

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1.0  
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31.0  
 32.0  
 30.0  
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 33.0  
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34.2  
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 34.2  
 32.0  
 34.5  
 34.5

C. E. Buell, Inc.  
 C. W. Burckhalter, Inc.  
 Consolidated Feed & Grain Co., Inc.  
 Dairymen's League Co-Operative Association, Inc.  
 General Commodity Corp.  
 Land O'Lakes Creameries, Inc.  
 Waddington Condensed Milk Co., Inc.  
 Ward Dry Milk Co.

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## Summary of Analyses

Season of 1932 - 1933.

	Samples.	Brands.	Manu- facturers.
<b>Alfalfa Products</b>			
Alfalfa Meal . . . . .	13	7	5
Alfalfa Leaf Meal . . . . .	13	4	4
Alfalfa Stem Meal . . . . .	1	1	1
<b>Animal and Fish Products</b>			
Bone Meal . . . . .	8	5	5
Fish Meal . . . . .	21	9	8
Meat Scrap . . . . .	14	11	10
Meat and Bone Scrap . . . . .	30	14	8
Milk Powders . . . . .	17	8	8
<b>Brewers and Distillers By-Products</b>			
Brewers Grains . . . . .	9	4	4
Distillers Grains . . . . .	4	2	2
<b>Cereal Meals</b>			
Corn Meal . . . . .	23	—	—
Corn Feed Meal . . . . .	1	1	1
Ground Oats . . . . .	31	—	—
Feeding Oatmeal . . . . .	8	3	3
Provender (Corn and Oats) . . . . .	22	—	—
<b>Corn Products</b>			
Gluten Feed . . . . .	35	9	7
Gluten Meal . . . . .	16	4	4
Hominy Feed . . . . .	30	11	9
<b>Miscellaneous Mill Residues</b>			
Beet Pulp . . . . .	12	2	1
Oat Feed . . . . .	10	4	2
Rye Feed . . . . .	5	1	1
<b>Oil Cake Meals</b>			
Soy Bean Meal . . . . .	9	4	4
Cottonseed Meal . . . . .	51	17	10
Linseed Meal . . . . .	26	7	7
<b>Wheat Products</b>			
Red Dog Flour . . . . .	10	8	8
Wheat Flour Middlings . . . . .	12	10	10
Wheat Standard Middlings . . . . .	38	17	17
Wheat Mixed Feed . . . . .	62	25	25
Wheat Bran . . . . .	73	31	30
<b>Mixtures for Animals</b>			
Calf Meals . . . . .	11	9	9
Dairy Feeds . . . . .	350	164	57
Fitting Rations . . . . .	22	10	7
Hog Feeds . . . . .	8	5	5
Molasses Feeds . . . . .	63	33	26
Rabbit Feeds . . . . .	6	4	4
Stock Feeds . . . . .	66	31	27
<b>Mixtures for Poultry</b>			
Chick Growing and Starting Feeds . . . . .	143	94	40
Chick Scratch Feeds . . . . .	16	15	15
Fattening Feeds . . . . .	19	15	12
Laying Mashies . . . . .	224	106	63
*Miscellaneous . . . . .	117	—	—
Totals . . . . .	1649	705	—

\*Consisting largely of material used by Massachusetts manufacturers in preparing registered feeds.

## Feeds Not Conforming to Guarantees.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
1	1	<b>Arcady Farms Milling Co.</b> Arcady 24% Open Formula Production Ration	1.2	—	—
8	1	<b>Ashcraft-Wilkinson Co.</b> Helmet Brand Prime Cottonseed Meal . . .	—	—	2.2
1	1	Paramount Brand Prime Cottonseed Meal . .	—	—	1.9
1	1	<b>Butchers Rendering Co.</b> Butchers Special Poultry Food . . . . .	1.5	—	—
2	2	<b>Cairo Meal &amp; Cake Co.</b> { Miss Cairo Brand 36% Cottonseed Meal . .	—	—	1.4
		{ Miss Cairo Brand 36% Cottonseed Meal . .	—	—	1.6
1	1	<b>Consolidated Rendering Co.</b> Corenco 60% Meat Scrap . . . . .	5.8	—	—
7	1	<b>Denver Alfalfa Milling &amp; Products Co.</b> . . Alfalfa Leaf Meal, Leafalfa Brand . . . .	1.3	—	—
2	2	<b>Eastern Grain Co.</b> { Eastern Stock Feed . . . . .	—	—	1.0
		{ Eastern Stock Feed . . . . .	—	—	3.8
1	1	<b>Elmore Milling Co.</b> Elmore 32% Supplemental Dairy Ration . .	1.4	—	—
2	1	<b>John W. Eshelman &amp; Sons</b> Eshelman's S-O-S . . . . .	—	—	1.3
2	1	<b>Farm Service Stores, Inc.</b> Diamond A Dairy Feed . . . . .	—	—	1.2
1	1	<b>Fernando Valley Milling &amp; Supply Co.</b> Fernando Ideal Greens, Suncured . . . .	1.5	—	2.0
3	3	<b>J. A. Forrest</b> { Alpine Feeding Oatmeal . . . . .	—	1.7	1.0
		{ Alpine Feeding Oatmeal . . . . .	—	1.0	—
		{ Alpine Feeding Oatmeal . . . . .	—	1.5	—
2	2	<b>J. B. Ham Co.</b> { Farmer Boy 18% Dairy Ration with Molasses	—	1.0	—
		{ Farmer Boy 18% Dairy Ration with Molasses	—	1.0	—
1	1	Farmer Boy Horse Feed . . . . .	—	1.3	—
8	1	<b>Kelloggs &amp; Miller, Inc.</b> K & M Brand Pure O. P. Linseed Oil Meal .	1.9	—	—
3	1	<b>Lake of the Woods Milling Co., Ltd.</b> Lakewoods Wheat Shorts . . . . .	—	1.3	—
1	1	<b>Lowell Rendering Co.</b> Perfection Poultry Feed . . . . .	1.4	—	—

## Feeds Not Conforming to Guarantees—Concluded.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
1	1	<b>Maritime Milling Co., Inc.</b> B. B. Bull Brand Dairy Ration . . . . .	—	1.0	—
1	1	<b>Geo. Q. Moon Co., Inc.</b> Moon's Baby Chick Grain . . . . .	—	1.8	—
9	1	<b>Ontario Milling Co., Inc.</b> Oswego 20% Dairy Feed with Molasses . . .	1.0	—	—
3	2	<b>Park &amp; Pollard Co.</b> { Milk Maid 24% Sweetened Dairy Ration . { Milk Maid 24% Sweetened Dairy Ration .	1.8 —	— 1.0	— —
2	2	<b>Pecos Valley Alfalfa Mill Co.</b> { Pevee Alfalfa Leaf Meal . . . . . { Pevee Alfalfa Leaf Meal . . . . .	— —	— —	2.2 5.0
1	1	<b>Quaker Oats Co.</b> Feeding Oat Meal . . . . .	1.2	—	—
6	1	<b>John Reardon &amp; Sons</b> 45% Register Brand Meat and Bone Scraps .	1.6	—	—
3	1	<b>St. Albans Grain Co.</b> Wirthmore 14 Fitting Ration . . . . .	—	—	1.7
2	2	<b>Sherwin-Williams Co. of Canada</b> . { Screwpress Linseed Oil Meal . . . . . { Screwpress Linseed Oil Meal . . . . .	2.9 2.9	— —	— —
3	1	<b>C. P. Washburn Co.</b> "Made Right" Balanced Ration . . . . .	—	1.3	—
3	1	"Made Right" Mixed Feed . . . . .	—	—	1.2
2	1	<b>H. K. Webster Co.</b> Blue Seal Improved All Mash Ration . . .	1.0	—	—

**Certified Ingredients**

Allied Mills, Inc.

**Amco 24% Dairy Ration**

Corn gluten feed, corn gluten meal, cottonseed oil meal, old process linseed oil meal, wheat standard bran, corn meal, ground oats, dried malt grains, soy bean oil meal, cane molasses, 1% steamed bone meal, 1% ground limestone and 1% salt.

**Amco 20% Dairy Ration**

Corn gluten feed, corn gluten meal, cottonseed oil meal, old process linseed oil meal, wheat standard bran, corn meal, ground oats, dried malt grains, soy bean oil meal, cane molasses, 1% steamed bone meal, 1% ground limestone and 1% salt.

**Red Feather Egg Mash**

Meat scraps, wheat standard middlings, corn meal, soy bean oil meal, fine ground alfalfa meal, fine ground oats, wheat standard bran, corn gluten feed, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

**Wayne All Mash Chick Starter with Cod Liver Oil and Sardine Oil**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, choice alfalfa meal, soy bean oil meal, wheat standard bran, 1.5% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt, cod liver oil and sardine oil.

**Wayne All Mash Grower**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, choice alfalfa meal, soy bean oil meal, wheat standard bran, 1.5% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

**Wayne All Mash Grower with Cod Liver Oil and Sardine Oil**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, choice alfalfa meal, soy bean oil meal, wheat standard bran, 1.5% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt, cod liver oil and sardine oil.

**Wayne Broiler Ration**

Dried buttermilk, dried skim milk, meat scraps, fish meal, ground yellow corn, fine ground oats, wheat standard middlings, wheat standard bran, soy bean oil meal, choice alfalfa meal, 1.5% ground limestone, 0.04% iron oxide, 0.0005% potassium iodide, 0.25% salt, cod liver oil and sardine oil.

**Wayne Egg Mash**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, wheat standard bran, corn meal, fine ground oat meal, corn gluten feed, old process linseed oil meal, choice alfalfa meal, soy bean oil meal, fine ground oats, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

**Wayne Egg Mash with Cod Liver Oil and Sardine Oil**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, wheat standard bran, corn meal, fine ground oat meal, corn gluten feed, old process linseed oil meal, choice alfalfa meal, soy bean oil meal, fine ground oats, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt, cod liver oil and sardine oil.

**Wayne Mash Concentrate**

Dried buttermilk, dried skim milk, fish meal, meat scraps, soy bean oil meal, old process linseed oil meal, corn gluten meal, corn gluten feed, choice alfalfa meal, 4% ground limestone, 0.15% iron oxide, 0.002% potassium iodide and 0.5% salt.

**Wayne Poultry Fattener**

Ground yellow corn, corn germ oil meal, white hominy feed, rolled oats, oat flour, fine ground oats, wheat standard middlings, wheat red dog flour, old process linseed oil meal and 1% salt.

**Wayne Turkey Mash**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, old process linseed oil meal, fine ground oats, choice alfalfa meal, soy bean oil meal, wheat standard bran, 3% charcoal, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

A. P. Ames Co.

**Ames Egg Mash, with or without Cod Liver Oil**

Dried milk, corn meal, wheat bran, wheat middlings, ground oat groats, meat scraps, fish meal, alfalfa meal, calcium carbonate and salt.

**Ames Growing Mash, with or without Cod Liver Oil**

Oat meal, corn meal, wheat bran, wheat middlings, meat scraps, fish meal, alfalfa meal, calcium carbonate, salt.

**Ames Starter and Broiler Ration**

Cod liver oil, dried milk, ground oat groats, corn meal, wheat bran, wheat middlings, alfalfa meal, meat scraps, fish meal, calcium carbonate and salt.

**20% Balanced Ration**

Corn meal, wheat bran, wheat middlings, ground oats, gluten feed, gluten meal, linseed meal, cotton seed meal, calcium carbonate, salt and bone meal.

**24% Milk Maker**

Corn meal or hominy, wheat bran, wheat middlings, ground oats, gluten feed, gluten meal, linseed meal, cotton seed meal, calcium carbonate, salt, bone meal.

## Arcady Farms Milling Co.

**Advanced Registry Dairy Feed**

Hominy feed, corn gluten meal, soy bean meal, o. p. linseed oil meal, corn gluten feed, dried grains from barley, malt and corn, wheat bran, wheat middlings, cottonseed meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Arcady Besbet Growing Mash**

Fish meal, meat scraps, animal liver meal, dried buttermilk, o. p. linseed oil meal, corn gluten feed, corn meal, wheat bran, wheat middlings, alfalfa meal, cod liver oil, bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Arcady Besbet Laying Mash**

Fish meal, meat scraps, animal liver meal, corn gluten meal, dried buttermilk, o. p. linseed oil meal, oat meal, corn meal, corn gluten feed, alfalfa meal, fine ground oats, wheat bran, wheat middlings, cod liver oil, bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Arcady Besbet Starting Mash**

Fish meal, meat scraps, animal liver meal, dried buttermilk, o. p. linseed oil meal, corn meal, ground oat groats, wheat middlings, flour middlings, alfalfa meal, bone meal, ground oats, dried yeast, cod liver oil, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Arcady Open Formula Production Ration**

Wheat bran, yellow hominy, o. p. linseed oil meal, ground white oats, corn gluten feed, cottonseed meal, corn gluten meal, cane molasses, salt, calcium carbonate from limestone, bone meal.

**Old Colony Feed**

Cottonseed meal, soy bean meal, hominy feed, corn gluten feed, o. p. linseed oil meal, dried beet pulp, wheat bran, wheat middlings, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Arcady 24% Open Formula Production Ration**

Wheat bran, hominy feed, o. p. linseed oil meal, ground oats, gluten feed, cottonseed meal, gluten meal, molasses, salt, calcium carbonate from limestone, bone meal.

**Peerless Milk Ration**

Cottonseed meal, soy bean meal, corn gluten meal, o. p. linseed oil meal, corn gluten feed, wheat bran, dried grains from barley, malt and corn, cleaned ground and bolted wheat screenings, ground and bolted clipped oat by-product, molasses, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**University all Mash Ration**

Fish meal, ground corn, wheat middlings, wheat bran, oat meal, alfalfa meal, meat scraps, animal liver meal, dried buttermilk, cod liver oil, steamed bone meal, 1% calcium carbonate from limestone, 1% salt.

**Wonder Complete Broiler Ration**

Fish meal, corn meal, ground oat groats, alfalfa leaf meal, pulverized oats, wheat middlings, wheat bran, meat scraps, animal liver meal, dried buttermilk, cod liver oil, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Wonderfat Station Feed**

Rolled oat groats, ground white corn, oat meal, corn oil cake meal, o. p. linseed oil meal, wheat flour, meat scraps,  $\frac{1}{2}$  of 1% salt.

E. W. Bailey & Co.

**Capital Dairy Ration**

Corn gluten feed, linseed oil meal, hominy feed, 43% cottonseed meal, ground oats, wheat bran, corn meal, edible bone meal, calcium carbonate and fine salt.

**Our 20% Special Dairy Ration**

Gluten feed, wheat middlings, oat-meal mill by-products (oat middlings, oat hulls, oat shorts), corn meal, wheat, cottonseed meal, molasses, salt, edible bone meal, calcium carbonate.

Beacon Milling Co., Inc.

**Auburn Dairy Feed**

Corn gluten feed, old process linseed oil meal, soy bean oil meal, ground oats, corn meal, ground grain screenings, cottonseed meal, wheat bran, ground barley, brewers' dried grains, molasses, 1% salt, 1% calcium carbonate, 1% calcium phosphate.

**Beacon Breeders Mash with Buttermilk**

Dried skim milk, dried buttermilk, fish meal, meat scrap, alfalfa leaf meal, corn meal, pulverized heavy oats, pulverized barley, corn gluten meal, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), soy bean oil meal, old process linseed oil meal, fortified cod liver oil,  $\frac{1}{2}$ % fine salt, 3% calcium carbonate, 1% calcium phosphate, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Beacon's Cayuga Growing Mash**

Dried skim milk, fish meal, meat scrap, old process linseed oil meal, pulverized heavy oats, corn meal, pulverized barley, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), alfalfa leaf meal, fortified cod liver oil, 3% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}$ % salt.

**Beacon's Cayuga Laying Mash with Buttermilk**

Dried buttermilk, dried skim milk, fish meal, meat scrap, corn meal, alfalfa leaf meal, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), soy bean oil meal, pulverized barley, corn gluten meal, pulverized heavy oats, fortified cod liver oil, 3% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}$ % salt.

**Beacon Complete Starting Ration**

Dried skim milk, meat scrap, fish meal, ground corn, ground hulled oats, pulverized heavy clipped oats, pulverized heavy barley, wheat bran (may contain mill run screenings), old process linseed oil meal, wheat red dog flour, alfalfa leaf meal, fortified cod liver oil,  $2\frac{1}{2}$ % calcium carbonate,  $\frac{3}{4}$ % calcium phosphate,  $\frac{1}{2}$ % salt.

**Beacon Dairy Ration**

Old process linseed oil meal, soy bean oil meal, corn gluten feed, corn distiller's dried grains, ground barley, corn gluten meal, hominy feed, corn meal, cottonseed meal, alfalfa meal, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), 1% calcium carbonate, 1% calcium phosphate, 1% salt.

**Beacon Egg Mash with Buttermilk**

Dried buttermilk, dried skim milk, meat scrap, fish meal, corn gluten meal, soy bean oil meal, old process linseed oil meal, pulverized barley, pulverized heavy oats, corn meal, alfalfa leaf meal, wheat bran (may contain mill run screenings), wheat middlings (may contain mill run screenings), fortified cod liver oil, 3% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}$ % fine salt, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Beacon Fleshing Mash and Crate Fattener**

Dried skim milk, pulverized oats, ground oat groats, pulverized barley, wheat low grade flour, corn meal, corn oil meal, rolled oats, old process linseed oil meal, fortified cod liver oil,  $1\frac{1}{2}$ % calcium carbonate,  $\frac{1}{2}$ % calcium phosphate, 1% salt.

**Beacon Special Coccidiosis Mash**

Dried skim milk, ground yellow corn, pulverized barley, wheat bran (may contain mill run screenings), fortified cod liver oil.

**Beacon Sweet "24"**

Old process linseed oil meal, soy bean oil meal, corn gluten meal, cottonseed meal, corn gluten feed, corn meal, brewers' dried grains, corn distillers' dried grains, wheat bran (may contain mill run screenings), ground oats, ground barley, molasses, 1% salt, 1% calcium carbonate.

**Berkshire Coal & Grain Co.****Green Mountain Laying Mash**

Wheat bran, wheat middlings, linseed oil meal, corn meal, fine ground oats, alfalfa meal, meat scraps, bone meal, fish meal, dried skim milk, calcium carbonate, salt, tested cod liver oil.

**Green Mountain Dairy Ration**

Wheat bran, cottonseed meal, corn gluten feed, linseed oil meal, corn meal, ground oats and barley, calcium carbonate, salt.

**Black Rock Milling Corp.****Bidwell 24% Dairy Ration**

Wheat bran, linseed oil meal, ground barley, cottonseed meal, corn gluten feed, fine ground grain screenings, malt sprouts, corn gluten meal, molasses, calcium carbonate and salt.

**Bidwell 20% Dairy Ration**

Wheat bran, linseed oil meal, malt sprouts, gluten feed, gluten meal, ground barley, cottonseed meal, fine ground grain screenings, molasses, calcium carbonate and salt.

**Bidwell Dry-Mash**

Dried buttermilk, alfalfa meal, corn meal, standard wheat bran and wheat middlings, fish meal, meat, bone, linseed oil meal, gluten meal, soy bean meal, calcium carbonate, salt, and ground: wheat, barley, kaffir corn and buckwheat.

**Borden Grain Co.****Borden's Dairy Feed**

Wheat bran, wheat middlings, corn meal or hominy, gluten meal, cotton seed meal, gluten feed, linseed oil meal, calcium carbonate, bonemeal, salt.

**Borden's Laying Mash**

Corn meal, wheat bran, wheat middlings, ground oatmeal, dried milk, alfalfa leaf meal, fish meal, meat scrap, calcium carbonate, salt.

**Community Feed Stores, Inc.****Community Chick Mash (starter-grower-broiler)**

Yellow hominy or corn meal, pulverized oats, bran, middlings, red dog flour, meat scraps, alfalfa meal, dried milk, bone meal, cod liver meal, fish meal, salt, cod liver oil.

**Community-20 Dairy Ration**

41% cottonseed meal, 34% linseed meal, gluten feed, hominy feed, ground oats, middlings, molasses, calcium carbonate, salt, bran.

**Community Milk Laying Mash**

Yellow hominy or corn meal, ground oats, bran, gluten feed, middlings, meat scraps, dried milk, alfalfa meal, salt, calcium carbonate, cod liver meal, cod liver oil.

**Hilltop-20 Dairy Ration**

Cottonseed meal 41%, linseed meal 34%, gluten feed, hominy feed, Vim feed, bran, middlings, calcium carbonate, salt, molasses.



## Nicolas Courcy

**Courcy's Dairy Feed**

Bran, middlings, Buffalo gluten, Diamond gluten, 41% cottonseed, 34% linseed, meal or hominy, salt, calcite flour.

**Courcy's Eastern Laying Mash**

Meal, wheat bran, wheat middlings, feeding oat meal, alfalfa leaf meal, dry skim milk, 50% beef scraps, fish meal, fine salt, calcite flour, with 1% cod liver oil or without.

**Courcy's Growing Feed**

Wheat bran, middlings, yellow corn meal, feeding oat meal, 50% scraps, linseed oil meal, bone meal, fish meal, calcite flour, leaf meal, milk, salt.

**Eastern Starting Feed**

Wheat bran, wheat middlings, yellow corn meal, feeding oat meal, bone meal, dry skim milk, leaf meal, fish meal, 60% beef scraps, cracked wheat, hulled oats, fine salt, calcite flour, with 1% cod liver oil or without.

## Cover &amp; Palm Co.

**The Perfect Dry Mash**

Alfalfa meal, hominy feed, corn meal, wheat mixed feed, animal meal, gluten feed, linseed oil meal, beef scraps, oats and oat feed, kaffir corn meal, dried buttermilk.

## E. A. Cowee Co.

**Coweco Growing Mash**

Wheat bran, wheat middlings, corn meal, oat meal, soya bean meal, alfalfa leaf meal, meat scraps, fish meal, dried milk, edible bone meal, calcium carbonate, salt, with or without cane molasses, with or without cod liver oil.

**Coweco Laying Mash**

Wheat bran, wheat middlings, oat meal, gluten feed, soya bean meal, linseed oil meal, meat scraps, fish meal, corn meal, dried milk, alfalfa leaf meal, edible bone meal, calcium carbonate, salt, with or without cane molasses, with or without cod liver oil.

**Coweco Lo-Price 20% Dairy Ratlon**

Bran, middlings, ground oats, cottonseed meal, corn meal, gluten meal, linseed meal, ground barley, soya bean meal, cane molasses, bone meal, calcium carbonate and salt.

**Coweco 1925 Ratlon**

Wheat bran and middlings, corn meal, cottonseed meal, gluten feed, linseed oil meal, hominy, ground oats, distillers' grains, brewers' grains, soya bean meal, edible bone meal, salt, calcium carbonate and molasses.

**Coweco 20% Ratlon**

Wheat bran and middlings, gluten feed, corn meal, distillers' grains, linseed meal, soya bean meal, ground oats, cottonseed meal, brewers' grains, molasses, edible bone meal, calcium carbonate and salt.

## Curley Brothers

**Crystal All Grain Startling Food**

Pure dry buttermilk, cod liver oil, yellow corn meal, ground oat groats, red dog flour, bran, alfalfa leaf meal, cracked wheat, fine cracked corn, steelcut oatmeal, steamed edible bone meal, powdered charcoal, salt, calcium carbonate, white fish meal.

**Crystal Egg Mash**

Yellow hominy feed, yellow corn meal, bran and middlings, with mill run of screenings, feeding oatmeal, red dog, alfalfa poultry greens, beef scraps, fish scraps, steamed bone meal, dried skim milk, salt, calcium carbonate.

**Crystal Growing Mash**

Cod Liver oil, dried skim milk, meat scraps, white fish meal, steamed edible bone meal, alfalfa poultry greens, red dog flour, bran and middlings with mill run of screenings, feeding oatmeal, yellow hominy feed, yellow corn meal, calcium carbonate, salt.

**Crystal 24% Dairy Ratlon**

Corn gluten meal, corn gluten feed, cottonseed meal, linseed oil meal, distillers' grains, hominy feed, ground barley, ground oats, bran and middlings with mill run of screenings, edible bone meal, salt, calcium carbonate.

**Crystal 20% Ratlon**

Corn gluten feed, yellow corn meal, hominy feed, bran and middlings with mill run of screenings, cottonseed meal, linseed oil meal, beet pulp, steamed edible bone meal, calcium carbonate, salt.

**Crystal Starting Food for Broilers**

Yellow hominy feed, yellow corn meal, ground oat groats, bran, middlings, red dog flour, alfalfa poultry greens, meat scraps, white fish meal, dried skim milk, pure dry buttermilk, fine cracked corn, steelcut oatmeal, cracked wheat, calcium carbonate, steamed edible bone meal, salt, cod liver oil.

## Cutler Co.

**King All Purpose Chick and Broiler Ratlon**

Fortified cod liver oil, yellow corn meal, wheat bran, wheat middlings, ground oat groats, high grade meat scraps, fish meal, alfalfa leaf meal, o.p. linseed meal, dried skim milk, edible bone meal, calcium carbonate, salt and pure cod liver meal.

**King Baby Chick Starter**

Fortified cod liver oil, cod liver meal, pure dried buttermilk, dried skim milk, alfalfa leaf meal, fish meal, fine ground beef scraps, edible bone meal, pure wheat bran, pure wheat middlings, ground hulled oats, ground wheat, yellow corn meal, corn germ meal, calcium carbonate and salt.

**King Dairy Feed with Beet Pulp Sweetened**

Dried beet pulp, cottonseed meal, old process linseed meal, wheat bran, wheat middlings, corn gluten feed, yellow corn meal, pure ground oats, edible bone meal, pure cane molasses and dairy salt.

**King Growing Feed Containing Buttermilk**

Pure dried buttermilk, dried skim milk, choice beef scraps, fish meal, edible bone meal, yellow corn meal, alfalfa leaf meal, old process linseed meal, ground wheat, oats, barley, milo maize wheat bran, wheat middlings, wheat reddog flour, calcium carbonate and salt.

**King Mash Feed Containing Buttermilk**

Pure dried buttermilk, dried skim milk, choice beef scraps, fish meal, yellow corn meal, alfalfa leaf meal, linseed meal, corn gluten feed, wheat bran, wheat middlings, ground rolled oats, oats, barley, buckwheat, milo maize, calcium carbonate and salt.

**King Mash Feed Containing Cod Liver Oil — Buttermilk**

Fortified cod liver oil, pure dried buttermilk, dried skim milk, choice beef scraps, fish meal, yellow corn meal, alfalfa leaf meal, linseed meal, corn gluten feed, wheat bran, wheat middlings, ground rolled oats, oats, barley, buckwheat, milo maize, calcium carbonate and salt.

**King 22 Milk Ration Sweetened**

Old process linseed meal, cottonseed meal, corn gluten meal, corn gluten feed, wheat bran, wheat middlings, yellow corn meal, ground barley, ground oats, alfalfa meal, bone meal, calcium carbonate, pure cane molasses and dairy salt.

**Delaware Mills, Inc.****Delaware All Mash Laying Food**

Cod liver oil, dried skim milk, meat scrap, bone meal, fish meal, linseed oil meal, corn gluten feed, corn meal, ground wheat, wheat bran, wheat middlings, wheat red dog flour, oat meal, ground barley, alfalfa leaf meal, calcium phosphate, salt.

**Delaware Growing Mash (with Dried Skim Milk)**

Dried skim milk, alfalfa leaf meal, meat scrap, fish meal, bone meal, linseed oil meal, corn gluten feed, corn meal, wheat bran, wheat middlings, wheat flour middlings, oat meal, wheat meal, calcium phosphate,  $\frac{1}{2}$  of 1% salt.

**Delco 24% Dairy Feed**

Linseed oil meal, corn gluten feed, corn gluten meal, peanut oil meal, cottonseed meal, wheat bran (which may contain mill run screenings), wheat middlings, corn meal, calcium phosphate, salt.

**Delco 20% Dairy Feed**

Dried beet pulp, linseed oil meal, corn gluten feed, corn gluten meal, peanut oil meal, cottonseed meal, wheat bran, wheat middlings, hominy feed, ground oats, salt, calcium phosphate.

**Indian Laying Mash (with Dried Skim Milk)**

Dried skim milk, meat scrap, fish meal, bone meal, corn gluten feed, alfalfa meal, wheat bran, wheat middlings, corn meal, ground barley, ground oats, soya bean oil meal, calcium phosphate and salt.

**Indian Sweet 20% Dairy Feed**

Cane molasses, linseed oil meal, corn gluten feed, cottonseed meal, soy bean meal, cocoanut oil meal, peanut oil meal, wheat bran, wheat middlings, corn meal, ground oats, ground barley, ground wheat screenings, calcium phosphate and salt.

**Frank Diauto****Diauto's Dairy Feed**

Gluten feed, corn meal, bran, ground oats, linseed meal, cotton seed meal, salt.

**Diauto's Special Egg Mash**

Coarse yellow corn meal, wheat bran, wheat flour middlings, ground oats, meat scraps, dried skimmed milk, fish meal, alfalfa leaf meal, ground oyster shells, common salt.

**Albert Dickinson Co.****Dickinson's Globe Egg Mash**

Dried buttermilk, fine ground meat scraps, fish meal, corn gluten feed, linseed oil meal, ground oat groats, wheat bran, wheat standard middlings, corn feed meal, fine ground alfalfa meal, cod liver oil, bone meal, 2% calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**Dickinson's Globe Growing Ration**

Dried buttermilk, sifted meat scraps, fish meal, yellow corn meal, ground oat groats, soy bean oil meal, wheat standard middlings, ground barley, alfalfa leaf meal, corn oil cake meal, cod liver oil, bone meal, 2% calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**Dickinson's Globe Starting Ration**

Dried buttermilk, sifted meat scraps, fish meal, yellow corn meal, ground oat groats, wheat standard middlings, alfalfa leaf meal, bone meal, cod liver oil, 2% calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**F. Diehl & Son, Inc.****Diehl's Dairy Feed**

Bran, brewers grains, cottonseed meal, gluten, linseed meal, corn meal, oat meal mill by-products, ground barley, pure ground oats, wheat middlings, salt, calcium carbonate, bone meal, sweetened.

**Diehl's Dry Mash**

Alfalfa, Banner Feed, bone, buttermilk, charcoal, fish scraps, gluten meal, linseed meal, meat scraps, middlings and red dog.

**Dietrich & Gambrill, Inc.****All Mash Starter & Grower**

Corn meal, oat meal, wheat middlings, alfalfa leaf meal, malt flour, peanut meal, fish meal, dried buttermilk, cod liver oil, bone meal, 1% calcium carbonate, 1% salt.

**D. & G. Dairy Feed**

Cottonseed meal, peanut meal, linseed meal, gluten feed, corn feed meal, wheat bran, ground grain screenings, clipped oat by-products, oat middlings, oat shorts, oat hulls, molasses, 1% bone meal, 1% calcium carbonate, 1% salt.

**D. & G. Turkey Mash**

Wheat bran, wheat middlings, corn meal, rolled oats, meat scrap, alfalfa leaf meal, charcoal, bone meal, 1% salt.

**Frederick Growing Mash**

Wheat middlings, wheat bran, pulverized oats, corn feed meal, gluten feed, meat scrap, dried buttermilk, alfalfa leaf meal, bone meal, 1% calcium carbonate, 1% salt.

**Frederick Laying Mash**

Wheat bran, wheat middlings, corn feed meal, pulverized oats, gluten meal, meat scrap, fish meal, alfalfa meal, cottonseed meal, bone meal, 1% calcium carbonate, 1% salt, dried buttermilk.

**Gambrill's Chick Starter**

Oat meal, corn meal, malt flour, alfalfa leaf meal, wheat flour middlings, peanut meal, fish meal, meat scrap, dried buttermilk, cod liver oil, bone meal, 1% calcium carbonate, 1% salt.

**Gambrill's 16% Dairy Feed**

Cottonseed meal, peanut meal, gluten feed, wheat bran, corn feed meal, ground grain screenings from wheat, clipped oat by-products, oat middlings, oat shorts, oat hulls, molasses, 1% bone meal, 1% calcium carbonate, 1% salt.

**Gambrill's A. I. Dairy Feed**

Gluten feed, cottonseed meal, linseed meal, peanut meal, dried brewers grains, wheat bran, corn feed meal, wheat middlings, ground oats, molasses, 1% calcium carbonate, 1% bone meal, 1% salt.

**Gambrill's Fattening Mash**

Red dog flour, corn meal, oat meal, linseed meal, meat scrap, bone meal, wheat bran, wheat middlings, malt flour, 1% salt.

**Gambrill's Laying Mash**

Wheat bran, wheat middlings, corn feed meal, linseed meal, pulverized oats, alfalfa leaf meal, gluten meal, malt flour, meat scrap, fish meal, dried buttermilk, bone meal, 1% calcium carbonate, 1% salt.

**Pen Mar Dairy Feed**

Gluten feed, cottonseed meal, linseed meal, peanut meal, dried brewers grains, ground oats, corn feed meal, wheat bran, wheat middlings, molasses, 1% calcium carbonate, 1% bone meal, 1% salt.

**J. L. Dunnell & Son****XL Dairy Ration 24%**

Corn meal, gluten feed, wheat bran, cottonseed meal, ground oats, oil meal, salt, bone meal, calcium carbonate.

**Excel 20% Dairy Ration**

Corn meal, gluten feed, cottonseed meal, wheat bran, ground oats, salt, bone meal, calcium carbonate.

**Excel Mash**

Corn meal, gluten feed, wheat bran, ground oats, red dog, fish scraps, dried milk, lime, salt and beef scraps.

**East Bridgewater Farmers Co-Operative Exchange, Inc.****Special Dairy Feed**

Brewers grains, wheat middlings, wheat bran, corn meal or hominy, ground oats, gluten meal, linseed meal, cottonseed meal, beet pulp, molasses, salt.

**Special Growing Feed**

Yellow corn meal, ground barley, ground heavy oats, wheat bran, wheat middlings, red dog flour, alfalfa leaf meal, beef scrap, dried skim milk, calcite flour, cod liver meal, cod liver oil, salt.

**Special Mash Feed**

Yellow corn meal, wheat bran, red dog flour, ground heavy oats, alfalfa leaf meal, beef scrap, dried skim milk, cod liver meal, salt.

**Eastern Grain Co.****Eastern All Purpose Dairy Feed**

Bran, middlings, corn meal, ground barley, oat meal mill by-products (oat middlings, oat shorts, oat hulls), linseed meal, gluten feed, gluten meal, soy bean meal, pure cane molasses, high grade edible bone meal, dairy salt.

**Eastern 24% Dairy Sweetened**

Bran, middlings, cottonseed, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten meal, ground barley, corn meal, cane molasses, soy bean meal, high grade edible bone meal, calcium carbonate, salt.

**Eastern 20% Dairy Feed Sweetened**

Bran, middlings, cottonseed meal, linseed meal, distillers grains, ground oats, gluten feed, gluten meal, ground barley, corn meal, cane molasses, soy bean meal, high grade bone meal, calcium carbonate, salt.

**Eastern States Farmers' Exchange****Eastern States Developer Mash with Oil**

E. S. yellow corn meal—attrition, standard wheat bran, wheat flour middlings, E. S. pure ground barley, E. S. pure ground oats, dry skim milk, soy bean oil meal, alfalfa leaf meal, E. S. meat scraps 50%, pure fish meal 55%, dicalcium phosphate, oyster shell meal, sardine oil, salt.

**Eastern States Fulpail Dairy Ration**

Standard wheat bran, choice yellow hominy, E. S. pure ground oats, corn gluten feed, E. S. choice cottonseed meal, soy bean oil meal, old process linseed oil meal—pure, corn distillers' dried grains, molasses, dicalcium phosphate, salt.

**Eastern States Highland 20**

E. S. choice cottonseed meal, oat shorts, oat middlings, oat hulls, choice yellow hominy, dried brewers' grains, standard wheat bran, molasses, soy bean oil meal, corn gluten meal, dicalcium phosphate, salt.

**Eastern States Highland 16**

Choice yellow hominy, oat shorts, oat middlings, oat hulls, standard wheat bran, dried brewers' grains, E. S. choice cottonseed meal, molasses, corn gluten meal, soy bean oil meal, dicalcium phosphate, salt.

**Eastern States Milkmore Dairy Ration**

E. S. choice cottonseed meal, choice yellow hominy, corn gluten feed, soy bean oil meal, standard wheat bran, E. S. pure ground oats, old process linseed oil meal—pure, corn distillers' dried grains, molasses, dicalcium phosphate, salt.

**Eastern States Producer Mash**

E. S. yellow corn meal—attrition, wheat flour middlings, standard wheat bran, E. S. pure ground oats, E. S. meat scraps 50%, pure fish meal 55%, alfalfa leaf meal, dry skim milk, oyster shell meal, dicalcium phosphate, salt.

**Eastern States Producer Mash with Oil**

E. S. yellow corn meal—attrition, standard wheat bran, wheat flour middlings, E. S. pure ground oats, E. S. meat scraps 50%, pure fish meal 55%, alfalfa leaf meal, dry skim milk, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Eastern States Sixteen Dairy Ration**

Choice yellow hominy, standard wheat bran, E. S. pure ground oats, E. S. choice cottonseed meal, corn gluten feed, old process linseed oil meal—pure, corn distillers' dried grains, molasses, dicalcium phosphate, salt.

**Eastern States Starting and Broiler Ration with Oil**

E. S. yellow corn meal—attrition, standard wheat bran, wheat flour middlings, ground oat groats, dry skim milk, alfalfa leaf meal, E. S. meat scraps 50%, pure fish meal 55%, oyster shell meal, salt, sardine oil, dicalcium phosphate.

**Eastern States 32% Supplement Feed**

E. S. choice cottonseed meal, soy bean oil meal, corn gluten meal, old process linseed oil meal—pure, molasses, standard wheat bran, corn distillers' dried grains, dried brewers' grains, dicalcium phosphate, salt.

**Eastern States Turkey-Fat**

E. S. yellow corn meal—attrition, standard wheat bran, wheat flour middlings, ground oat groats, dry skim milk, E. S. meat scraps 50%, alfalfa leaf meal, oyster shell meal, dicalcium phosphate, salt.

**Eastern States Turkey-Grow**

E. S. No. 2 yellow corn meal—attrition, standard wheat bran, wheat flour middlings, ground oat groats, E. S. meat scraps 50%, dry skim milk, alfalfa leaf meal, pure fish meal 55%, sardine oil, oyster shell meal, dicalcium phosphate, salt.

**Eastern States Turkey Starter**

E. S. yellow corn meal—attrition, E. S. meat scraps 50%, standard wheat bran, dry skim milk, wheat flour middlings, ground oat groats, pure fish meal 55%, alfalfa leaf meal, sardine oil, oyster shell meal, dicalcium phosphate, salt.

**Michael W. Ellis****The Ellis Dairy Feed**

Corn meal, wheat middlings, wheat bran, gluten meal, hominy feed, gluten feed, corn distillers' grains, cottonseed meal, oil meal, ground oats, calcite flour, salt and edible bone meal. (Wheat feeds may contain screenings not exceeding mill run.)

**The Ellis Poultry Mash**

Wheat bran, wheat middlings, hominy feed, gluten, corn meal, rolled oats or feeding oatmeal, alfalfa leaf meal, cod liver oil, beef scraps, dried skim milk or buttermilk, edible bone meal, salt, charcoal and calcite flour. (Wheat feeds may contain screenings not exceeding mill run.)

**Elmore Milling Co., Inc.****Elmore Chixsaver**

Dried milk, wheat flour midds, wheat bran, corn meal, alfalfa leaf meal, oat flour, meat and bone meal, fish meal, cod liver oil, fine table salt.

**Elmore Complete Broiler Ration**

Yellow corn meal, wheat bran, wheat middlings, oat meal flour, meat meal, edible bone meal, dried buttermilk, alfalfa leaf meal, cod liver oil, salt.

**Elmore Eggmaker**

Dried buttermilk, meat and bone meal, wheat bran, wheat red dog midds, corn meal, fish meal, ground oats, calcium carbonate, salt.

**Elmore Egg Mash**

20% dried buttermilk and meat scraps, 2nd clear wheat flour, pure ground oats, wheat middlings, alfalfa leaf meal, corn meal or hominy feed, wheat bran, cod liver oil, not more than 1% calcium carbonate, salt.

**Elmore Growing Mash**

Dried buttermilk, meat meal, bone meal, wheat midds, wheat bran, low grade wheat flour, alfalfa leaf meal, corn meal, oat flake, gluten feed, salt, cod liver oil.

**Elmore Milk Grains**

Corn distillers' grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cottonseed meal, dried brewers' grains, calcium carbonate, salt, soy bean oil meal.

**Elmore Milk Grains Junior**

Corn distillers' grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cottonseed meal, dried brewers' grains, calcium carbonate, salt, soy bean oil meal.

**Elmore 16% Pasture Ration**

Pure ground oats, corn meal or hominy feed, wheat bran, wheat middlings, cottonseed meal, cane molasses, corn gluten feed, calcium carbonate, salt. (Wheat bran may contain ground screenings not exceeding mill run.)

**Elmore 32% Supplemental Dairy Ration**

Corn gluten feed, corn gluten meal, choice cottonseed meal, linseed oil meal, wheat bran, soy bean oil meal, cane molasses, calcium carbonate, salt.

**Elmore's Sweet Digesto Dairy Feed**

Corn gluten feed, cottonseed meal, wheat bran, coconut oil meal, pulverized wheat screenings, oat meal mill by-products (oat hulls, oat midds and oat shorts), cane molasses, salt.

**Elmore Turkey Growing Mash**

Dried buttermilk, oat flour, meat meal and bone meal, corn meal, alfalfa leaf meal, wheat bran, wheat midds, second clear wheat flour, cod liver oil, salt.

**Emco Feed**

Wheat bran, wheat midds, linseed oil meal, beet pulp, corn gluten feed, corn meal or hominy feed, cottonseed meal, calcium carbonate, salt.

**Granger 20% Dairy Ration**

Wheat bran, wheat midds, ground barley, cottonseed meal, corn gluten feed, corn meal or hominy feed, soy bean meal, cane molasses, reground wheat screenings, calcium carbonate, salt.

**R-Own Egg Mash**

Wheat bran, wheat midds, meat and bone meal, corn meal, ground oats, corn gluten feed, dried buttermilk, red dog wheat flour, calcium carbonate, salt.

**John W. Eshelman & Sons****Eshelman Challenge Dairy Feed**

Wheat bran, cottonseed meal, corn gluten feed, wheat middlings, soy bean oil meal, cane molasses, dried brewers' grains, ground oats, corn feed meal, o.p. oil meal, reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Conestoga 20 Dairy Feed**

Wheat bran, corn gluten feed, dried brewers' grains, cottonseed meal, cane molasses, wheat middlings, soy bean oil meal, o.p. oil meal, oat meal mill by-product (oat midds, oat hulls, oat shorts), reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Golden Rod 25 Dairy Feed**

Wheat bran, wheat middlings, corn gluten feed, dried brewers' grains, cottonseed meal, soy bean oil meal, o.p. oil meal, corn feed meal, ground oats, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Lancaster 20 Dairy Feed**

Wheat bran, corn gluten feed, wheat middlings, dried brewers' grains, cane molasses, cottonseed meal, soy bean oil meal, corn feed meal, ground oats, o.p. oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Open Formula 20 Dairy Feed**

Wheat bran, ground oats, corn meal, o.p. oil meal, corn gluten feed, 41% cottonseed meal, soy bean oil meal, cane molasses, bone meal, calcium carbonate, salt.

**Eshelman Red Rose 24 Dairy Feed**

Wheat bran, wheat middlings, corn gluten feed, dried brewers' grains, cottonseed meal, o.p. oil meal, soy bean oil meal, cane molasses, corn feed meal, ground oats, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Red Rose Growing Mash with Cod Liver Oil**

Wheat middlings, corn meal, wheat bran, meat scrap, pulverized oats, corn gluten feed, pure oat meal, hominy feed, o.p. oil meal, fish meal, 3% dried buttermilk, 2% fine alfalfa meal,  $\frac{1}{2}\%$  salt,  $\frac{1}{4}\%$  fortified cod liver oil.

**Eshelman Red Rose Laying Mash**

Wheat middlings, corn meal, meat scrap, wheat bran, corn gluten feed, ground oats, o.p. oil meal, fish meal, hominy feed, 3% fine alfalfa meal, 3% dried buttermilk,  $\frac{1}{2}\%$  salt.

**Eshelman Red Rose Laying Mash with Cod Liver Oil**

Wheat middlings, corn meal, meat scrap, wheat bran, corn gluten feed, ground oats, o.p. oil meal, fish meal, hominy feed, 3% fine alfalfa meal, 3% dried buttermilk,  $\frac{1}{2}\%$  salt,  $\frac{1}{4}\%$  fortified cod liver oil.

**Eshelman Red Rose Turkey Mash**

Corn meal, rolled oats, wheat bran, wheat middlings, meat scrap, alfalfa leaf meal, dried buttermilk, fish meal, 3% charcoal,  $\frac{1}{2}\%$  salt,  $\frac{1}{4}\%$  fortified cod liver oil.

**Farm Service Stores, Inc.****Big C Growing Mash**

Corn feed meal, wheat feed, ground oats, scraps, dried skim (or dried buttermilk), fish scraps, fine ground alfalfa, calcium carbonate,  $\frac{1}{2}\%$  salt, cod liver oil.

**Big C Mash**

Corn feed meal (or yellow hominy), heavy mixed feed, gluten feed, old process oil meal, 45% meat scraps, fine ground alfalfa, ground oats, bone meal, calcium carbonate,  $\frac{1}{2}\%$  salt.

**Big C Special Dairy Feed**

Cottonseed meal, old process oil meal, hominy (or corn meal), corn gluten feed, wheat bran, wheat midds, ground oats, 1% salt, 1% steamed bone meal, calcium carbonate.

**Diamond A Dairy Feed**

Corn feed meal (or yellow hominy), old process oil meal, corn gluten feed, wheat bran, dried brewers' grains, corn gluten meal, cottonseed meal, stock feed, 1% salt, 1% calcium carbonate.

**Diamond C Dairy Feed**

Wheat bran, wheat midds, corn meal (or yellow hominy), cottonseed meal, old process oil meal, beet pulp, gluten feed, gluten meal, salt.

**Narragansett Indian Egg Mash**

Dried skim milk or buttermilk, meat scraps, wheat middlings, yellow corn meal or yellow hominy, wheat bran, corn gluten feed, ground oats, hulled barley, ground oat blowings, old process oil meal, ground alfalfa meal, fish meal, ground calcite, salt.

**Narragansett Indian Growing Mash**

Dried skim milk or buttermilk, 45% meat scraps, fish meal, wheat middlings, second clear flour, corn feed meal or hominy, wheat bran, corn gluten feed, ground oats, ground barley, hulled barley, old process oil meal, alfalfa meal, salt, bone meal, calcite flour, fine charcoal.

**New England Dairy Ration**

Diamond gluten meal, Buffalo gluten feed, wheat bran, yellow corn meal or yellow hominy, old process oil meal, cottonseed meal, Sugared Vim Feed, ground limestone, salt.

**Quality Growing Mash**

With or without cod liver oil. Corn feed meal or yellow hominy, pulverized or ground oats, fine alfalfa meal, wheat midds, wheat bran, gluten feed, old process oil meal, calcium carbonate, 45% meat scraps, bone meal, fish meal, 1% salt, dried skim or dried buttermilk.

**Quality Laying Mash**

With or without cod liver oil. Corn feed meal (or yellow hominy), ground or pulverized oats, fine alfalfa meal, wheat midds, wheat bran, gluten feed, old process oil meal, calcium carbonate, 45% meat scraps, 1% bone meal, fish meal, dried buttermilk (or dried skim milk),  $\frac{1}{2}\%$  salt.

**Vigor 15% Dairy**

Soy bean meal, brewers' grains, corn and oat feed, wheat bran, gluten feed, cottonseed meal, old process oil meal, oat feed, cane molasses, calcium carbonate 1%, bone meal 1%, salt 1%, wheat midds, barley flour.

**Flory Milling Co., Inc.****Flory's "All-Mash" Chick Starter**

Dried buttermilk, ground oat groats, dried tomato pulp, milk sugar feed (dried whey), yellow corn meal, wheat bran, wheat middlings, meat meal, fish meal, crab meal, linseed oil meal, pulverized barley, reinforced cod liver oil, alfalfa leaf meal, ground wheat, charcoal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's "All-Mash" Growing Ration — with Cod Liver Oil**

Yellow corn meal, dried buttermilk, dried tomato pulp, ground white oats, ground barley, wheat middlings, wheat bran, corn gluten meal, meat meal, fish meal, crab meal, soy bean meal, linseed oil meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), pure cod liver oil.



**Flory's Dairy Feed**

Cottonseed meal, o.p. oil meal, soya bean meal, corn gluten feed, corn gluten meal, dried brewers' grains, corn meal, alfalfa meal, standard wheat bran, standard wheat middlings, ground oats, molasses, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's Egg Mash with Cod Liver Oil**

Ground oat groats, dried buttermilk, milk sugar feed (dried whey), wheat flour middlings, yellow corn meal, corn gluten meal, wheat bran, dried tomato pulp, fine ground barley, meat meal, fish meal, crab meal, alfalfa leaf meal, linseed oil meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), pure cod liver oil.

**Golden Egg Laying Mash**

Dried buttermilk, meat meal, fish meal, crab meal, dried tomato pulp, linseed oil meal, soya bean meal, yellow corn meal, wheat flour middlings, ground barley, wheat bran, ground white oats, choice alfalfa meal, corn gluten meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Golden Egg Laying Mash with Cod Liver Oil**

Dried buttermilk, meat meal, fish meal, crab meal, dried tomato pulp, linseed oil meal, soy bean meal, yellow corn meal, wheat flour middlings, ground barley, wheat bran, ground white oats, choice alfalfa meal, corn gluten meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), pure cod liver oil.

**Record Dairy Feed**

Cottonseed meal, soya bean meal, corn gluten feed, corn gluten meal, standard wheat middlings, standard wheat bran, o.p. oil meal, dried brewers' grains, corn meal, ground oats, molasses, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Sunray Dairy Feed**

Corn gluten feed, standard wheat bran, cottonseed meal, yellow corn meal, pure cane molasses, hominy feed, linseed oil meal, ground oats, standard wheat middlings, 1% calcium carbonate, 1% steamed bone, 1% salt, soy bean meal, dried malt grains.

**Sunray Laying Mash**

Wheat bran, wheat middlings, yellow corn meal, soya bean meal, meat meal, fish meal, crab meal, corn gluten meal, choice alfalfa meal, cottonseed meal, ground barley, ground white oats, molasses, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Fred A. Fountain****Fountain's Buttermilk Growing Feed**

Dry buttermilk or dry skim milk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, table salt.

**Fountain's Buttermilk Laying Mash**

Dry buttermilk or dry skim milk, beef scrap, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, fish meal, table salt.

**Fountain's Buttermilk Starting Feed**

Dry buttermilk or dry skim milk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, calcium carbonate, table salt.

**Dean S. French****Special Mash or Poultry Feed**

Wheat feed, corn meal, gluten feed, alfalfa meal, linseed meal, meat scraps, ground oats, ground bone, charcoal, dried milk, salt, cod liver oil.

**J. B. Garland & Son****Garland's Economy 20% Dairy Ration**

Bran, middlings, cottonseed meal, gluten meal, linseed meal, ground barley, dried brewers' grains, distillers' grains, soy bean meal, cane molasses, bone meal, calcium carbonate and salt.

**Garland's Growing Mash**

Corn meal, wheat bran and middlings, red dog flour, calf meal, oat meal, alfalfa leaf meal, soy bean meal, dried milk, meat scraps, fish meal, calcium carbonate, salt and bone meal. (With or without cod liver oil.) (With or without cane molasses.)

**Garland's Poultry Mash**

Wheat bran and middlings, corn meal, gluten meal, oat meal, alfalfa, soy bean meal, meat scraps, fish meal, dried milk, calcium carbonate, salt, bone meal. (With or without cod liver oil.) (With or without cane molasses.)

**Garland's 24% Ration**

Wheat bran, middlings, corn meal, hominy, gluten feed, linseed meal, cottonseed meal, soy bean meal, ground oats, brewers' grains, distillers' grains, bone meal, calcium carbonate, salt and cane molasses.

**Royal Worcester Complete Ration**

Gluten feed, linseed, ground oats, wheat bran, middlings, corn meal, cottonseed meal, soy bean meal, beet pulp, salt, calcium carbonate, bone meal and cane molasses.

**General Mills, Inc.****Eventually Gold Medal Chick Ration**

Yellow corn meal, standard wheat middlings (with ground grain screenings not exceeding mill run), wheat germ, fine ground oat groats, alfalfa meal, sifted meat scraps, dried buttermilk, cod liver oil, vitamin extract, ground limestone 2½%, salt ¾%.

**Eventually Gold Medal Dairy Ration**

Wheat bran, wheat germ, standard wheat middlings (with ground grain screenings not exceeding mill run), pulverized oats, yellow corn meal, corn gluten feed, cottonseed meal, linseed oil meal, ground limestone  $2\frac{3}{4}\%$ , salt  $\frac{3}{4}\%$ .

**Eventually Gold Medal Egg Mash for Breeding and Laying with Dried Buttermilk**

Yellow corn meal, standard wheat middlings (with ground grain screenings not exceeding mill run), corn gluten feed, wheat red dog, fine ground oat groats, alfalfa meal, wheat germ, linseed oil meal, sifted meat scraps, dried buttermilk, ground limestone  $1\%$ , salt  $\frac{1}{2}\%$ .

**Eventually Gold Medal Growing Mash with Dried Buttermilk**

Corn oil meal, yellow corn meal, standard wheat middlings (with ground grain screenings not exceeding mill run), fine ground oat groats, alfalfa meal, sifted meat scraps, dried buttermilk, wheat germ, ground limestone  $2\frac{3}{4}\%$ , salt  $\frac{3}{4}\%$ .

W. K. Gilmore & Sons, Inc.

**Neponset Poultry Mash**

Wheat bran, wheat middlings, corn meal, ground oats, alfalfa, beef scraps, fish scraps, linseed oil meal, corn gluten feed, ground rolled oats, calcite flour, dried skim milk, fine salt.

Frank A. Goode

**New England Conference Starting & Growing Mash**

Coarse yellow corn meal, wheat bran, wheat flour middlings, ground oats or oat groats, meat scraps  $50\%$  protein, fish meal  $50\%$  protein, dried skim or dried buttermilk, alfalfa leaf meal, ground oyster shells, salt. With or without  $1\%$  cod liver oil.

**Storrs Worlds Record Laying Mash**

Coarse yellow corn meal, wheat bran, wheat flour middlings, ground oats, meat scraps  $50\%$  protein, fish meal  $50\%$  protein, alfalfa leaf meal, dried skim milk, calcium carbonate or ground oyster shells, salt.

D. H. Grandin Milling Co.

**Grandin's Baby Chick Starter with Buttermilk — Cod Liver Oil**

Dried buttermilk, fine ground hulled oats, ground wheat, corn meal, hominy feed, wheat middlings, alfalfa leaf meal, calcium carbonate, bone meal, one-half of one per cent salt and cod liver oil.

**Grandin's 24% Balanced Dairy Ration**

Distillers dried grains, cottonseed meal, cocoanut oil meal, linseed oil meal, corn gluten feed, wheat bran, wheat middlings, hominy feed, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Complete Starting Ration with Buttermilk — Cod Liver Oil**

Dried buttermilk, cod liver oil, ground meat and bone, fish meal, wheat bran, wheat middlings, alfalfa leaf meal, hominy feed, ground yellow corn, pulverized oats, ground wheat, ground hulled oats, ground barley, calcium carbonate and salt.

**Grandin's Growing Mash with Buttermilk — Cod Liver Oil**

Ground meat and bone, dried buttermilk, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, alfalfa meal, bone meal, calcium carbonate, salt and cod liver oil. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Laying Mash with Buttermilk**

Ground fish, ground meat and bone, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, powdered buttermilk, alfalfa meal, calcium carbonate and a small percentage of salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Milk Maker**

Linseed oil meal, cottonseed meal, cocoanut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, beet pulp, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Poultry Green Food**

Alfalfa meal, dried beet pulp and cane molasses.

**Grandin's Sweetened 24% Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 16% Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground barley, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 12 Twin Six 12 Dairy Feed**

Linseed oil meal, cottonseed meal, cocoanut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, alfalfa meal, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)



**M-S (Money Saver) 20% Sweet Dairy Feed**

Cottonseed meal, corn gluten feed, linseed oil meal, wheat bran, wheat middlings, ground barley, corn meal, corn feed meal, hominy feed, ground grains screenings, oat meal mill by-products (oat middlings, oat hulls, oat shorts), cane molasses, steamed bone meal, calcium carbonate and salt.

**Great Atlantic & Pacific Tea Co.**

**Daily Egg Mash Feed**

Ground oats, ground barley, soy bean oil meal, old process linseed oil meal, corn gluten meal, wheat standard middlings, wheat bran, alfalfa meal, corn feed meal, dried buttermilk, dried skimmed milk, meat and bone scrap, fish meal, flour middlings, cod liver oil, cod liver meal, calcium carbonate from limestone 2.5%, steamed bone meal 1½%, salt ½%, red iron oxide 1-10%, and .0015% potassium iodide.

**Hales & Hunter Co.**

**Red Comb Broiler Mash with Dried Buttermilk**

Whole ground corn, fine ground feeding oat meal, pulverized oats, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean meal, dried buttermilk and not over 3% minerals, (calcium carbonate, sodium chloride, steamed bone meal, granulated charcoal, iron sulphate, sulphur).

**Red Comb Chick Starter with Dried Buttermilk**

Whole ground corn, ground oat groats, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa leaf meal, soy bean meal, dried buttermilk and not over 5% minerals, (calcium carbonate, sodium chloride, steamed bone meal, granulated charcoal, iron sulphate, sulphur).

**Red Comb Crate Fattener with Rolled Oats**

Bolted corn meal, ground oat groats, pulverized oats, corn oil cake meal, linseed oil meal, wheat middlings, low grade wheat flour, rolled oats, steamed bone meal, salt.

**Red Comb Egg Mash with Dried Buttermilk**

Corn feed meal, feeding oat meal, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean meal, dried buttermilk, and not over 5% minerals, (calcium carbonate, sodium chloride, steamed bone meal, granulated charcoal, iron sulphate, sulphur).

**Red Horn 20% Dairy Feed**

Corn hominy feed, crimped oat, dried brewers' grains, wheat bran, linseed oil meal, corn gluten feed, corn gluten meal, cottonseed meal, soy bean meal, molasses, calcium carbonate, salt.

**J. B. Ham Co.**

**Farmer Boy 24% Dairy Ration with Molasses**

Wheat standard bran, cottonseed meal, bone meal, linseed meal, corn gluten meal, corn meal, corn gluten feed, molasses, salt 1%, calcium carbonate 1%.

**Farmer Boy 20% Dairy Ration with Molasses**

Wheat standard bran, linseed meal, cottonseed meal, bone meal, corn meal, ground oats, corn gluten feed, molasses, salt 1%, calcium carbonate 1%.

**Farmer Boy 18% Dairy Ration with Molasses**

Corn gluten feed, cottonseed meal, wheat standard bran, wheat standard middlings, linseed meal, oat middlings, oat shorts, oat hulls, corn meal, molasses, calcium carbonate 1%, salt 1%.

**Farmer Boy Egg Mash with Dried Skim Milk and Cod Liver Oil**

Wheat standard bran, wheat standard middlings, wheat flour middlings, meat scraps, linseed meal, soy bean meal, sardine meal, dried skim milk, alfalfa leaf meal, corn meal, pulverized oats, iodized salt 1%, calcium carbonate 2%, cod liver oil.

**Hamco Egg Mash with Dried Skim Milk and Cod Liver Oil**

Wheat standard bran, wheat standard middlings, wheat flour middlings, meat scraps, linseed meal, dried skim milk, alfalfa leaf meal, corn meal, pulverized oats, iodized salt 1%, calcium carbonate 1%, cod liver oil.

**D. Harbeck**

**Welcome Dairy Feed**

Bran, beet pulp, cottonseed meal, corn gluten meal, ground oats, hominy or corn feed meal, oil meal, middlings, steamed bone meal 1%, salt 1%.

**Horvitz Grain Co.**

**Make-M-Lay Laying Mash**

Wheat bran, corn meal, gluten feed and gluten meal, ground oats, ground barley, red dog, wheat middlings, linseed meal, meat scraps, calcium carbonate, charcoal.

**Wantmore Dairy Ration**

Hominy feed or corn meal, wheat bran, ground oats, gluten feed and gluten meal, linseed meal, cottonseed meal, wheat middlings, calcium carbonate, salt.

**Open Formula Mash**

Coarse corn meal, wheat bran, white middlings, ground oats 40-42, meat scraps 55% protein, alfalfa leaf meal, steamed bone meal, dried milk, common salt.

**Wantmore 24% Dairy Ration Sweetened**

Bran, middlings, cottonseed meal, linseed meal, distillers ground oats, Buffalo gluten, Diamond gluten, ground barley, corn meal, pure cane molasses, high grade edible bone meal, salt, calcium carbonate, soy bean meal.

**Wantmore 20% Dairy Ration Sweetened**

Bran, middlings, 43% cottonseed meal, linseed meal, distillers' grains, ground oats, Buffalo gluten, cane molasses, high grade edible bone meal, calcium carbonate, salt, soy bean meal, Diamond gluten, ground barley, corn meal.

**Wantmore Dairy with Beet Pulp**

Hominy feed or corn meal, wheat bran, gluten feed & gluten meal, linseed meal, cottonseed meal, wheat middlings, salt, beet pulp, calcium carbonate.

Jersee Co.

**Just Right Egg Mash**

Standard middlings, standard bran, corn meal, corn gluten feed, fine ground oats, meat scraps, fish meal, charcoal, calcium carbonate (limestone), alfalfa meal, powdered whole and skim milk, St. John's bread (locust bean meal), starch, milk sugar, wheat red dog, oxide iron, dicalcium phosphate, anise, dried blood, iodized salt, yeast, cod liver oil.

Larrowe Milling Co.

**Larro — The Ready Ration for Dairy Cows**

Yellow corn meal, cottonseed meal, standard wheat middlings (with ground grain screenings not exceeding mill run), o. p. linseed oil meal, corn gluten feed, dried beet pulp, wheat bran,  $\frac{3}{4}\%$  salt.

**Larro Broiler Feed**

Yellow corn meal, oatmeal, standard wheat middlings (with ground grain screenings not exceeding mill run), meat and bone scraps, alfalfa meal, wheat bran, dried buttermilk, dried skim milk, cod liver oil vitamin extract,  $\frac{1}{2}\%$  salt, 2% ground limestone.

**Larro Chick Starter**

Oatmeal, yellow corn meal, standard wheat middlings (with ground grain screenings not exceeding mill run), dried skim milk, dried buttermilk, meat and bone scraps, wheat bran, alfalfa meal, cod liver oil vitamin extract,  $\frac{1}{2}\%$  salt,  $1\frac{1}{2}\%$  ground limestone.

**Larro Egg Mash**

Oatmeal, standard wheat middlings (with ground grain screenings not exceeding mill run), yellow corn meal, alfalfa meal, wheat bran, meat and bone scraps, dried buttermilk, dried skim milk, cod liver oil vitamin extract,  $2\frac{1}{2}\%$  ground limestone,  $\frac{3}{4}\%$  salt.

**Larro Growing Mash**

Yellow corn meal, oatmeal, wheat bran, standard wheat middlings (with ground grain screenings not exceeding mill run), meat and bone scraps, dried buttermilk, dried skim milk, alfalfa meal, cod liver oil vitamin extract, 2% ground limestone,  $\frac{1}{2}\%$  salt.

Mansfield Milling Co.

**"Mansfield" Dry-Poultry-Mash**

Wheat bran, wheat middlings, red dog flour, corn meal, gluten feed, dried milk and meat scraps.

**"Mansfield" Cow-Ration**

Wheat bran, corn meal, ground oats, ground barley, cotton seed meal, linseed meal, gluten feed, gluten meal and salt.

**"Mansfield" Chick-Growing-Feed**

Wheat bran, red dog flour, corn meal, oat meal, fish scraps, meat scraps, dried milk and charcoal.

Maritime Milling Co., Inc.

**B B Bull Brand All Mash Broiler Growing Ration**

Cod liver oil, milk sugar feed, dried buttermilk, alfalfa leaf meal, wheat bran, wheat middlings, ground wheat, corn meal, ground oat meal, pulverized oats, soya bean oil meal, meat meal, fish meal, steamed bone meal, calcium carbonate and salt.

**B B Bull Brand All Mash Chick Starter Ration Vitamized with Cod Liver Oil, Milk Sugar Feed, Dried Buttermilk**

Cod liver oil, milk sugar feed, dried buttermilk, alfalfa leaf meal, wheat middlings, corn meal, soya bean oil meal, ground oat meal, meat meal, fish meal, ground wheat, steamed bone meal, calcium carbonate and salt.

**B B Bull Brand Dairy Ration**

Dried brewers grains, o. p. linseed oil meal, cottonseed meal, corn gluten feed, soya bean oil meal, hominy feed, corn meal, wheat bran, wheat middlings, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Sweetened B B Bull Brand "24" Dairy Ration**

Dried brewers grains, o. p. linseed oil meal, cottonseed meal, corn gluten feed, soya bean oil meal, hominy feed, corn meal, wheat bran, wheat middlings, molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**B-B Daisy All Mash Starter and Growing Feed Vitamized with Cod Liver Oil, Milk Sugar Feed, Dried Buttermilk**

Cod liver oil, milk sugar feed, dried buttermilk, alfalfa leaf meal, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, ground oat meal, meat meal, fish meal, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain mill run of ground screenings.)

**B-B Daisy Egg Mash with Dried Buttermilk**

Dried buttermilk, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, fish meal, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain mill run of ground screenings.)

**B-B Hi-Test Dairy Feed 20% Pro. Sweetened**

Dried brewers' grains, o. p. linseed oil meal, cottonseed meal, corn gluten feed, soya bean oil meal, hominy feed, ground oats, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

**B-B Marmico 16% Protein Dairy Feed with Molasses**

Dried brewers' grains, soya bean oil meal, cottonseed meal, corn gluten feed, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, oat hulls, oat shorts, oat midds, molasses, steamed bone meal, calcium carbonate and salt.

**B-B Red-E-Mixt Egg Mash Vitamized with Cod Liver Oil and Dried Buttermilk**

Cod liver oil, dried buttermilk, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, fish meal, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain mill run of ground screenings.)

**Sweetened Dollar Maker Dairy Feed 24% Pro.**

Dried brewers' grains, soya bean oil meal, corn gluten feed, o. p. linseed oil meal, cottonseed meal, corn meal, hominy feed, wheat bran, ground oats, molasses, calcium carbonate, salt and steamed bone meal. (Wheat bran may contain ground screenings not exceeding mill run.)

**Sweetened Dollar Maker 20% Pro. Dairy Feed**

Dried brewers grains, soya bean oil meal, corn gluten feed, o. p. linseed oil meal, cottonseed meal, corn meal, hominy feed, wheat bran, ground oats, molasses, calcium carbonate, salt and steamed bone meal. (Wheat bran may contain ground screenings not exceeding mill run.)

**Dollar Maker Egg Mash Vitamized with Cod Liver Oil**

Cod liver oil, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Dollar Maker Growing Mash Vitamized with Cod Liver Oil**

Cod liver oil, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Matheson Vail Co.****Mavco Laying Mash**

Coarse corn meal, wheat bran, wheat middlings, ground oats, meat scraps 50%, fish meal 50%, dried skim milk, salt, alfalfa leaf meal, ground oyster shells, cod liver oil.

**Geo. Q. Moon & Co., Inc.****Moon's Baby Chick Starter Mash**

Roller corn meal, wheat middlings, our make white wheat middlings, fine ground alfalfa meal, meat scrap, bone meal, dried buttermilk, calcium carbonate, calcium phosphate, cod liver oil,  $\frac{1}{2}$  of 1% salt, wheat bran, dried skim milk.

**Moon's 24% Dairy Ration**

Corn distillers grains, o. p. oil meal, corn gluten meal, cottonseed meal, corn gluten feed, wheat middlings and wheat bran (with ground screenings not to exceed mill run), dried brewers' grains, calcium carbonate,  $\frac{3}{4}$  of 1% salt, corn meal, soy bean meal, molasses.

**Moon's Special A Laying Mash with Dried Buttermilk**

Meat scrap, alfalfa meal, standard wheat middlings (with ground screenings not to exceed mill run), corn meal, ground barley, ground oats, ground buckwheat, calcium carbonate, calcium phosphate,  $\frac{1}{2}$  of 1% salt, dried buttermilk.

**Ontario Milling Co., Inc.****Aunt Mary's Laying Mash with Cod Liver Oil**

Dried skim milk, Nopco XX cod liver oil, meat meal, white fish meal, steamed bone meal, heavy poultry pulverized oats, calcium carbonate, soy bean oil meal, old process linseed oil meal, hominy feed or corn meal, corn gluten meal, wheat bran, wheat middlings, alfalfa meal, 1% salt. (Wheat feeds may contain ground screenings not to exceed mill run.)

**Big Value 20% Dairy Feed with Molasses**

Cottonseed meal, soy bean oil meal, wheat bran, wheat middlings, coconut oil meal, old process linseed oil meal, corn gluten feed, corn gluten meal, hominy feed or corn meal, ground oats, molasses, steamed bone meal, 1% calcium carbonate, 1% salt. (Wheat bran and wheat middlings may contain screenings not to exceed mill run.)

**Butterfat Dairy Feed with Molasses**

Old process linseed oil meal, wheat bran, corn gluten feed, corn gluten meal, hominy feed or corn meal, cottonseed meal, soy bean oil meal, coconut oil meal, ground barley, ground oats, molasses, steamed bone meal, 1% calcium carbonate, 1% salt. (Wheat bran may contain screenings not to exceed mill run.)

**Oswego 24% Dairy Feed with Molasses**

Cottonseed meal, soy bean oil meal, corn gluten feed, hominy feed or corn meal, wheat bran, malt grains, ground wheat screenings, molasses, steamed bone meal, calcium carbonate, salt. (Wheat bran may contain screenings not to exceed mill run.)

**Oswego 20% Dairy Feed with Molasses**

Cottonseed meal, soy bean oil meal, wheat bran, wheat middlings, corn gluten feed, hominy feed or corn meal, o. p. linseed oil meal, malt grains, ground wheat screenings, molasses, 1% steamed bone meal, alfalfa meal, 1% salt, 1% calcium carbonate, coconut oil meal. (Wheat bran and wheat middlings may contain screenings not to exceed mill run.)

**Oswego Laying Mash**

Dried skim milk, meat meal, white fish meal, heavy poultry pulverized oats, soy bean oil meal, old process linseed oil meal, hominy feed or corn meal, corn gluten feed, wheat bran, wheat middlings, wheat flour middlings, ground oats, alfalfa meal, steamed bone meal, calcium carbonate, 1% salt. (Wheat feeds may contain ground screenings not to exceed mill run.)

**Park & Pollard Co.****All-In-One Starting Feed**

Dried buttermilk, vitamin tested cod liver oil, ground wheat, ground barley, corn meal, ground oat groats, alfalfa leaf meal, wheat bran, wheat middlings, Iodol fish meal, meat and bone meal, calcium carbonate and salt.

**Bet-R-Milk 20% Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, malt sprouts, wheat bran, wheat middlings, hominy feed, Iodol fish meal, molasses, calcium carbonate and salt.

**Growing Feed**

Dried buttermilk, alfalfa leaf meal, Iodol fish meal, linseed oil meal, meat and bone meal, wheat bran and wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley.

**Lay or Bust Dry-Mash**

Dried buttermilk, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soya bean meal, wheat bran and wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley, kaffir corn, buckwheat.

**Lay or Bust Dry-Mash with Cod Liver Oil**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soy bean meal, wheat bran and wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley, kaffir corn, buckwheat.

**Milk-Maid 24% Sweetened Dairy Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, distillers dried grains, wheat bran, brewers' dried grains, malt sprouts, corn gluten meal, copra oil meal, corn meal, Iodol fish meal, molasses, calcium carbonate and salt.

**Overall 24% Dairy Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, distillers dried grains, wheat bran, wheat middlings, corn gluten meal, hominy feed, calcium carbonate and salt.

**Park & Pollard Chick Starter**

Dried buttermilk, vitamin tested cod liver oil, ground: corn, wheat, barley, oat meal, Iodol fish meal, meat and bone meal, wheat bran, wheat middlings, alfalfa leaf meal, rice, calcium carbonate and salt.

**Park & Pollard Turkey Grower**

Corn meal, ground: wheat, barley, oats, wheat bran, wheat middlings, alfalfa leaf meal, Iodol fish meal, meat and bone meal, buttermilk, calcium carbonate and salt.

**George H. Parker Grain Co.****Parker's Egg Mash**

Yellow corn meal, wheat bran, wheat middlings, ground oats, feeding oat meal, dried skimmed milk, meat scrap, fish meal, alfalfa leaf meal, edible bone meal, calcium carbonate, charcoal and salt.

**Parker's Special Dairy Ration**

Wheat bran, yellow corn meal, hominy, old process linseed meal, oat feed, corn gluten feed, cottonseed meal, molasses, calcium carbonate, steamed bone meal and salt.

**W. N. Potter Grain Stores, Inc.****A. D. P. 24% Dairy Ration**

Ground corn, hominy, cotton seed meal, corn gluten meal, wheat bran, ground oats, oil meal, calcium carbonate, bone meal, and salt.

**Potter's Sweetened Dairy Ration**

Gluten feed, hominy, linseed oil meal, ground oats, wheat bran, standard wheat middlings, cotton seed meal, corn distillers grains, molasses, calcium carbonate, bone meal and salt.

**H. C. Puffer Co.****Egg-Em-On Growing Feed**

Corn feed meal, corn gluten feed, ground barley, ground oats, wheat bran, wheat middlings, meat scraps, dried milk, alfalfa meal.

**Egg-Em-On Laying Mash**

Dried milk, dried fish, meat scraps, wheat bran and wheat middlings (not exceeding mill run of screenings), corn feed meal, corn gluten feed, ground oats, linseed meal, alfalfa meal, small percentage salt and calcium carbonate.

**Producer Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, corn gluten meal, ground oats, corn feed meal, wheat bran and wheat middlings (not exceeding mill run of screenings), small percentage salt and calcium carbonate.

**Quaker Oats Co.****Quaker Ful-O-Pep Chick Starter**

Oatmeal, yellow hominy feed, wheat bran, wheat middlings, fish meal, cod liver meal, meat scraps, cod liver oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal, 2% steamed bone meal,  $\frac{3}{4}$  of 1% salt.

**Quaker Fui-O-Pep Egg Mash**

Oatmeal, hominy feed, yellow hominy feed, wheat bran, wheat middlings, barley meal, fish meal, cod liver meal, meat scraps, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Quaker Fui-O-Pep Growing Mash**

Oatmeal, yellow hominy feed, wheat bran, wheat middlings, barley meal, fish meal, cod liver meal, meat scraps, dried skimmed milk, dried buttermilk, molasses, alfalfa meal, 1% steamed bone meal,  $\frac{3}{4}$  of 1% salt.

**Quaker 16% Protein Dairy Ration**

Hominy feed, yellow hominy feed, cottonseed meal, linseed meal, gluten feed, wheat bran, wheat middlings, ground grain screenings from wheat, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% ground limestone, molasses.

**Quaker 20% Protein Dairy Ration**

Hominy feed, yellow hominy feed, barley meal, cottonseed meal, corn gluten feed, linseed meal, wheat bran, wheat middlings, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% ground limestone, molasses.

**Quaker 24% Protein Dairy Ration**

Hominy feed, yellow hominy feed, cottonseed meal, corn gluten feed, linseed meal, wheat bran, wheat middlings, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% ground limestone, molasses.

**Ralston Purina Co.****Protana 24% Dairy Feed (Buffalo Mill)**

Cottonseed meal, corn gluten feed, wheat middlings (standard), wheat bran, oat mill feed (oat shorts, oat hulls, oat middlings), ground grain screenings (from wheat, flax, corn, oats, barley, kafir), molasses, 1% iodized salt.

**Protana 20% Dairy Feed**

Cottonseed meal, corn gluten feed, wheat middlings (standard), wheat bran, molasses, 1% iodized salt.

**Purina All Mash Egg Chowder**

Dried buttermilk, cod liver oil, meat scrap, soy bean oil meal, alfalfa meal, wheat middlings, wheat bran, corn meal,  $\frac{1}{2}$ % iodized salt, 4% calcium carbonate (limestone).

**Purina All Mash Startena Chow**

Dried buttermilk, cod liver oil, meat scrap, fish meal, alfalfa leaf meal, wheat germ, linseed meal, corn germ meal, oat middlings, corn meal, wheat bran, grey wheat middlings,  $1\frac{1}{2}$ % calcium carbonate (limestone),  $\frac{1}{4}$ % iodized salt.

**Purina Breeder Egg Chowder**

Dried buttermilk, cod liver oil, alfalfa meal, meat scrap, soy bean oil meal, linseed meal, corn germ meal, wheat middlings, wheat bran, corn meal, 1% iodized salt, 3% calcium carbonate (limestone).

**Purina Chicken Fatena Chow**

Ground oats, ground corn, corn germ meal, wheat flour (second clear), grey wheat middlings, ground barley, linseed meal, rolled oats,  $\frac{1}{4}$ % iodized salt,  $1\frac{1}{2}$ % calcium carbonate (limestone).

**Purina Chick Growena Chow**

Dried buttermilk, meat scrap, fish meal, soy bean oil meal, wheat germ, corn germ meal, wheat middlings, wheat bran, alfalfa meal, corn meal, 3% calcium carbonate (limestone), 1% iodized salt.

**Purina 34% Cow Chow**

Linseed meal, soy bean oil meal, corn gluten meal, cottonseed meal, alfalfa meal, molasses, 1% iodized salt.

**Purina 24% Cow Chow**

Linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, wheat middlings (standard), wheat bran, alfalfa meal, molasses, 1% iodized salt.

**Purina 20% Cow Chow**

Dried beet pulp, linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, wheat, middlings (standard), wheat bran, corn meal, alfalfa meal, molasses, 1% iodized salt.

**Purina Lay Chow**

Soy bean oil meal, meat scrap, molasses, alfalfa meal, corn meal, wheat middlings, wheat bran, 1% iodized salt, 4% calcium carbonate (limestone).

**Purina Lay Chow (With Dried Buttermilk)**

Dried buttermilk, soy bean oil meal, meat scrap, molasses, alfalfa meal, corn meal, wheat middlings, wheat bran, 1% iodized salt, 4% calcium carbonate (limestone).

**Reuben W. Ropes****Ropes Balanced Ration**

Yellow meal, hominy, gluten feed, cottonseed meal, bran, oil meal, beet pulp, alfalfa meal, oat feed, ground wheat, rolled oats, gluten meal, molasses, edible bone meal, calcium carbonate, salt.

**Ropes Poultry Hash**

Corn meal, hominy, gluten feed, oil meal, oat feed, cottonseed meal, wheat meal, bran, alfalfa meal, bone meal, oat meal, dry milk, buttermilk dry, beef scraps, calcium carbonate, salt.



**Ropes Sweet Ration**

Hominy, bran, cottonseed meal, oat feed, gluten feed, rye meal, corn meal, gluten meal, alfalfa meal, molasses, calcium carbonate, salt.

**Ryther & Warren****Blue Tag Dairy Ration**

41% Cottonseed meal, old process linseed oil meal, corn gluten feed, white hominy, standard bran, standard middlings, ground oats, dried beet pulp, calcium carbonate 1% and salt  $\frac{1}{2}$  of 1%.

**Minot Milk Egg Mash**

Yellow corn meal, wheat bran, flour middlings, ground 40-lb. oats, meat scraps 50% pro., fish scraps 55% pro., alfalfa leaf meal, steamed bone meal, dried milk, salt.

**Minot Poultry Mash**

Wheat bran, wheat middlings, red dog, corn meal, gluten feed, alfalfa meal, ground oats, oat flour, fish and meat scraps, and  $\frac{1}{2}$  of 1% of salt.

**St. Albans Grain Co.****Hygrade 24 Sweetened Milk Ration**

Corn gluten meal, corn gluten feed, old process linseed meal, old process soy bean oil meal, cottonseed meal, brewers' dried grains, corn meal, ground oats, ground barley, wheat bran, wheat middlings, steamed bone meal, calcium carbonate, dairy salt and pure cane molasses.

**Hygrade 20 Sweetened Milk Ration**

Old process linseed meal, o. p. soy bean oil meal, cottonseed meal, brewers' dried grains, corn gluten meal, corn gluten feed, corn meal, ground oats, ground barley, wheat bran, wheat middlings, pure cane molasses, steamed bone meal, calcium carbonate and dairy salt.

**Hygrade 16 Sweetened Milk Ration**

Old process linseed meal, cottonseed meal, brewers' dried grains, corn gluten meal, corn gluten feed, corn meal, ground oats, ground barley, wheat bran, wheat middlings, pure cane molasses, steamed bone meal, calcium carbonate and dairy salt.

**Utility Dairy Ration**

Old process linseed meal, o. p. soy bean oil meal, corn gluten feed, cottonseed meal, corn meal, ground oats, ground barley, brewers' dried grains, oat meal mill by-products (oat middlings, oat shorts, oat hulls), wheat bran, wheat middlings, steamed bone meal, calcium carbonate, pure cane molasses and dairy salt.

**Wirthmore All Purpose Chick and Broiler Ration**

Fortified cod liver oil, yellow corn meal, wheat bran, wheat middlings, ground oat groats, high grade meat scraps, fish meal, alfalfa leaf meal, old process linseed oil meal, dried skim milk, calcium carbonate, salt and pure cod liver meal.

**Wirthmore 25 Balanced Ration**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, brewers' dried grains, pure ground oats, cottonseed meal, corn gluten feed, yellow corn meal, wheat middlings, wheat bran, edible bone meal and dairy salt.

**Wirthmore 25 Balanced Ration Sweetened**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, brewers' dried grains, pure ground oats, cottonseed meal, corn gluten feed, yellow corn meal, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

**Wirthmore Complete Ration for Layers**

Fortified cod liver oil, dried skim milk, choice beef scraps, fish meal, whole oat groats, ground yellow corn, alfalfa leaf meal, ground wheat, wheat bran, wheat middlings, calcium carbonate and salt.

**Wirthmore 20 Dairy Feed**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, pure ground oats, wheat middlings, wheat bran, edible bone meal and dairy salt.

**Wirthmore 20 Dairy Feed Sweetened**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, pure ground oats, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

**Wirthmore 16 Dairy Ration Sweetened**

Corn gluten meal, corn distillers' dried grains, corn gluten feed, old process linseed meal, brewers' dried grains, yellow corn meal, pure ground oats, wheat bran, wheat middlings, cottonseed meal, edible bone meal, pure cane molasses and dairy salt.

**Wirthmore Dairy Feed with Beet Pulp Sweetened**

Dried beet pulp, cottonseed meal, old process linseed meal, wheat bran, wheat middlings, corn gluten feed, yellow corn meal, pure ground oats, edible bone meal, pure cane molasses and dairy salt.

**Wirthmore Fleshing & Fattening Mash**

Fortified cod liver oil, dried skim milk, choice beef scraps, feeding oatmeal, wheat red dog flour, wheat middlings, ground yellow corn, hominy feed, ground barley and pulverized oats.

**Wirthmore Growing Mash**

Pure dried buttermilk, dried skim milk, choice beef scraps, fish meal, yellow corn meal, alfalfa leaf meal, old process linseed meal, ground wheat, oats, barley, milo maize, wheat bran, wheat middlings, wheat red dog flour, calcium carbonate and salt.

**Wirthmore Growing Mash (containing Fortified Cod Liver Oil)**

Fortified cod liver oil, pure dried buttermilk, dried skim milk, choice beef scraps, fish meal, yellow corn meal, alfalfa leaf meal, old process linseed meal, ground wheat, oats, barley, milo maize, wheat bran, wheat middlings, wheat red dog flour, calcium carbonate and salt.

**Wirthmore Laying Mash**

Pure dried buttermilk, dried skim milk, choice beef scraps, fish meal, yellow corn meal, alfalfa leaf meal, linseed meal, corn gluten feed, wheat bran, wheat middlings, ground rolled oats, oats, barley, buckwheat, milo maize, calcium carbonate and salt.

**Wirthmore Turkey Growing Ration**

Dried skim milk, choice beef scraps, fish meal, alfalfa meal, yellow corn meal, fine ground oats, wheat bran, wheat middlings, wheat flour middlings, calcium carbonate and salt.

**Syracuse Milling Co.****Syracuse Dairy Feed**

Corn meal, ground oats, wheat bran and wheat middlings with mill run screenings, toasted wheat feed (wheat and wheat bran processed), corn gluten feed, linseed meal, cottonseed meal, soy bean oil meal, distillers' dried grains, brewers' dried grains, calcium carbonate and salt.

**Syracuse Dairy Feed, Sweetened**

Corn meal, ground oats, wheat bran and wheat middlings with mill run screenings, toasted wheat feed (wheat and wheat bran processed), corn gluten feed, linseed meal, cottonseed meal, soy bean oil meal, distillers' dried grains, molasses, calcium carbonate and salt.

**Tioga-Empire Feed Mills, Inc.****Egatine, With Cod Liver Oil Added**

Wheat middlings, corn meal, corn gluten meal, wheat bran, cod liver oil, meat and bone scrap, pulverized oats, fish meal, corn gluten feed, alfalfa leaf meal, soy bean oil meal, phosphate of lime, dried skim milk, calcium carbonate, salt. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**E-Gee Dairy Feed**

Wheat bran, cane molasses, wheat middlings, hominy feed, corn gluten feed, cottonseed meal, salt, peanut oil meal, phosphate of lime, charcoal, iodine. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**Red Brand Tioga Dairy Feed**

Cottonseed meal, soy bean oil meal, coconut oil meal, wheat bran, wheat middlings, cane molasses, peanut oil meal, corn gluten feed, salt, phosphate of lime, charcoal, iodine. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**Tioga Chick and Growing Mash**

Corn meal, wheat middlings, wheat bran, soy bean oil meal, phosphate of lime, fish meal, meat and bone scrap, powdered buttermilk, calcium carbonate, linseed oil meal, alfalfa leaf meal, pulverized oats, corn gluten meal, salt.

**Tioga Laying Food**

Wheat middlings, corn meal, wheat bran, pulverized oats, fish meal, soy bean oil meal, corn gluten feed, meat and bone scrap, alfalfa leaf meal, calcium carbonate, salt, dried skim milk, phosphate of lime, linseed oil meal, hominy feed. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**United Cooperative Farmers, Inc.****United Farmers Milk Egg Mash**

No. 2 yellow corn meal — attrition, standard wheat bran, wheat flour middlings, pure gr. oats (No. 2 — 38 lb. clpd-unsul.), meat scraps 50%, pure fish meal 55%, alfalfa leaf meal, pure dried buttermilk, steamed bone meal, salt.

**United Farmers Milk Pep**

Choice cottonseed meal, old pro. linseed meal, choice yellow hominy, corn gluten feed, pure gr. oats (No. 2 — 38 lb. clpd-unsul.), soy bean oil meal, stand. wheat bran, corn dist. dried grains, molasses, steamed bone meal, calcium carbonate, salt.

**United Farmers Milkmaker**

Choice yel. hominy, pure gr. oats (No. 2 — 38 lb. clpd-unsul.), stand. wheat bran, choice cottonseed meal, old pro. linseed oil meal, corn gluten feed, soy bean oil meal, molasses, corn dist. dried grains, steamed bone meal, calcium carbonate, salt.

**C. P. Washburn Co.****"Made Right" Balanced Ration**

Cottonseed meal, linseed oil meal, corn gluten, wheat bran, corn meal, oat feed, beet pulp, charcoal, calcium carbonate, salt, bone meal, ground oats, soya bean meal, brewer's grain.

**"Made Right" Dry Mash**

Corn meal, wheat bran, wheat middlings, red dog, 2nd clear flour, ground oatmeal, linseed oil meal, gluten feed, soya bean meal, ground wheat, meat scraps, fish meal, dried skim milk, alfalfa leaf meal, molasses, charcoal, calcium carbonate, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

**"Made Right" Starting and Growing Feed**

Corn meal, wheat bran, wheat middlings, oat meal, gluten meal, red dog, 2nd clear flour, meat scraps, ground wheat, soya bean meal, fish meal, dried skim milk, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

## H. K. Webster Co.

**Blue Seal Breeders' Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground heavy oats, ground rolled oats, ground barley, corn gluten meal, 50% meat scraps, dried skim milk, 55% codfish meal, alfalfa leaf meal, salt, calcium carbonate, and cod liver oil.

**Blue Seal "20" Dairy Ration**

Choice cottonseed meal, hominy feed, malt sprouts, gluten feed, wheat bran, ground oats, P. R. cane molasses, peanut skins, germs, and meal, o. p. oil meal, white fish meal, and salt.

**Blue Seal Growing Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground oats, ground barley, h. g. meat scraps, dried skim milk, dried buttermilk, 55% fish meal, gluten meal, alfalfa leaf meal, calcium carbonate, and salt.

**Blue Seal Improved All-Mash Ration**

Coarse ground No. 2 yellow corn, ground fancy wheat, fine ground heavy oats, pure wheat bran, wheat flour middlings, h. g. meat scraps, dried skim milk, dried buttermilk, alfalfa leaf meal, P. R. cane molasses, edible bone meal, salt, cod liver oil, and cod liver meal blend.

**Blue Seal Improved Balanced Ration**

Choice cottonseed meal, hominy feed, malt sprouts, gluten meal, wheat bran, ground oats, P. R. cane molasses, peanut skins, germs, and meal, o. p. oil meal, corn distillers grains, white fish meal, and salt.

**Blue Seal Hom-Mix 24% Dairy Ration**

Choice cottonseed meal, gluten meal, malt sprouts, wheat bran, P. R. cane molasses, oat feed, o. p. oil meal, peanut skins, germs, and meal, hominy feed, calcium carbonate, and salt.

**Blue Seal Laying Mash**

No. 2 yellow corn meal, pure wheat bran, fine ground heavy oats, h. g. meat scraps, corn gluten meal, wheat flour middlings, ground barley, ground fancy wheat, P. R. cane molasses, alfalfa leaf meal, dried skim milk, dried buttermilk, 55% codfish meal, salt, calcium carbonate, and cod liver meal blend.

**Blue Seal Milk Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, fine ground heavy oats, 50% meat scraps, dried skim milk, 55% fish meal, alfalfa leaf meal, salt, cod liver oil, and cod liver meal blend.

**Blue Seal Special 20% Dairy Ration**

Choice cottonseed meal, gluten feed, malt sprouts, wheat bran, P. R. cane molasses, oat feed, o. p. oil meal, peanut skins, germs, and meal, hominy feed, calcium carbonate, and salt.

**Blue Seal Starting Ration**

Coarse ground No. 2 yellow corn, ground fancy wheat, fine ground heavy oats, ground rolled oats, ground barley, pure wheat bran, wheat flour middlings, high grade meat scraps, dried skim milk, alfalfa leaf meal, calcium carbonate, salt, cod liver oil, 55% fish meal.

## West-Nesbitt, Inc.

**All Pure 20% Milk Ration**

Choice cottonseed meal, corn gluten meal, old process linseed oil meal, corn gluten feed, wheat bran, wheat middlings, hominy feed or corn meal, pure cane molasses, 1% steamed bone meal, 1% calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**Pure Feed Egg Maker**

Dried skim milk, bone and meat meal, old process linseed oil meal, corn gluten feed, wheat middlings, wheat flour middlings, hominy or corn meal, steamed bone meal, 1% calcium carbonate, 1% salt.

**Super Pure Feed Dairy Ration**

Corn gluten feed, wheat middlings, wheat bran, dried yeast grains, hominy or corn meal, cottonseed meal, old process linseed oil meal, 1% steamed bone meal, 1% calcium carbonate,  $\frac{1}{2}$  of 1% salt.

## Est. M. G. Williams

**Williams' Balanced Ration**

Corn meal or hominy, linseed oil meal, cottonseed meal, ground oats, gluten feed, wheat feed, bone meal, 1% salt, dried brewers' grains.

**Williams' Chick Starter & Broiler Ration**

Corn meal, cut oat groats, beef scraps, middlings, bran, alfalfa leaf meal, dried skim milk, linseed meal, bone meal, lime, granulated charcoal and fine salt.

**Williams' Growing Feed**

Corn meal, bran, middlings, oatmeal, dried skim milk, leaf meal, fish meal, beef scraps, dicalcium phosphate, calcium carbonate, salt, and cod liver oil.

**Williams' Laying Mash**

Corn meal, bran, middlings, ground oats, beef scraps, fish meal, leaf meal, dried skim milk, dicalcium phosphate, calcium carbonate, salt and cod liver oil.

## Stanley Wood Grain Co.

**Bliss Dairy Ration**

Corn meal (or hominy), cottonseed meal, wheat bran, linseed meal, wheat middlings, gluten meal, gluten feed, table salt, edible bonemeal, calcium carbonate, (beet pulp).



**Preferred Laying Mash**

Pure dried skim milk, dried fish meal, alfalfa leaf meal, beef scraps, yellow corn meal, wheat bran, pulverized oats, wheat middlings, edible bonemeal, table salt, calcium carbonate.

**Preferred Starting & Growing Feed**

Pure dried skim milk, dried fish meal, yellow corn meal, wheat bran, wheat middlings, fine ground oatmeal, alfalfa leaf meal, beef scraps, edible bonemeal, table salt, calcium carbonate.

**Wood's Dairy Ration**

Wheat middlings, malt sprouts, linseed meal, corn meal (or hominy), wheat bran, cottonseed meal, gluten feed, ground oats, edible bonemeal, molasses, calcium carbonate, salt.

**Water Soluble Protein in Meat Scraps and Fish Meal.**

Experimental work at the Indiana Experiment Station<sup>1</sup> has indicated that the water insoluble protein of meat scraps is a more accurate index of their food value than the total protein, although rations containing scrap of high water soluble protein content can be so balanced by the addition of the proper supplementary feeds as to compensate for certain deficiencies.

As a result of this work in Indiana, all samples of meat scraps officially collected in Massachusetts during the season of 1932-33 were analyzed for water soluble protein. The amount of water soluble protein in meat scraps is dependent upon the character of the material rendered. Material high in connective tissue is also high in water soluble protein. Factory inspection has not been attempted; consequently we have no record of the kind of material used, and the results are appended simply to indicate the nature of the meat scraps sold in Massachusetts in relation to their water soluble and water insoluble protein.

**Water Soluble Protein in Meat Scraps.**

Manufacturer and Brand.	Total Protein Per Cent.	Insoluble Protein Per Cent.	Soluble Protein Per Cent.	Percentage of Total Protein Soluble.
<b>Butchers Rendering Co.</b>				
Butchers Special . . . . .	58.49	42.37	16.12	27.56
45% . . . . .	51.49	39.72	11.77	22.86
45% . . . . .	48.39	37.13	11.21	23.19
Average . . . . .	49.94	38.43	11.49	23.03
<b>Consolidated Rendering Co.</b>				
Corenco 50% . . . . .	52.01	37.52	14.49	27.86
<b>John Kern &amp; Son . . . . .</b>				
Cumberland . . . . .	44.61	20.10	24.51	54.94
<b>Lincoln Farm Products Co.</b>				
Farm . . . . .	51.23	36.26	14.97	29.22
<b>Lowell Rendering Co.</b>				
Premium . . . . .	48.92	36.22	12.70	25.96
Perfection . . . . .	53.55	40.97	12.58	23.49
<b>Geo. E. Marsh Co.</b>				
Gem . . . . .	48.86	36.99	11.87	24.29
Diamond . . . . .	52.71	38.04	14.67	27.83
<b>Monti-Van Iderstine Co.</b>				
Movan . . . . .	53.85	36.14	17.71	32.89
<b>Jas. F. Morse Co.</b>				
50% . . . . .	53.06	35.76	17.30	32.06
55% . . . . .	57.97	33.30	24.67	42.56
55% . . . . .	57.48	33.70	24.78	43.09
Average . . . . .	57.73	33.50	24.72	42.83

<sup>1</sup>Curtis, P. B., Hauge, S. M., and Kraybill, H. R. The nutritive value of certain animal protein concentrates. Jour. Nutrition 5 (No. 5): 503-517. 1932.

## Water Soluble Protein in Meat Scraps—Concluded.

Manufacturer and Brand.	Total Protein Per Cent.	Insoluble Protein Per Cent.	Soluble Protein Per Cent.	Percentage of Total Protein Soluble.
<b>Jas. F. Morse Co.—Continued.</b>				
45% . . . . .	47.72	32.85	14.87	31.16
45% . . . . .	46.80	35.42	11.38	24.32
45% . . . . .	43.43	32.51	10.92	25.14
45% . . . . .	47.68	33.98	13.70	28.73
45% . . . . .	44.65	33.06	11.59	25.96
45% . . . . .	47.76	36.68	11.18	23.41
Average . . . . .	46.34	34.08	12.27	26.45
<b>New England Rendering Co.</b>				
Bull . . . . .	49.91	37.34	12.57	25.19
Brighton Special . . . . .	57.97	37.58	20.39	35.41
Brighton Special . . . . .	57.53	37.74	19.79	34.40
Average . . . . .	57.75	37.66	20.09	34.91
<b>John Reardon &amp; Sons Co.</b>				
60% Register . . . . .	59.81	47.61	12.20	20.40
50% Register . . . . .	51.66	36.99	14.67	28.40
50% Register . . . . .	52.10	36.45	15.65	30.04
Average . . . . .	51.88	36.72	15.16	29.22
45% Register . . . . .	47.80	34.95	12.85	26.88
45% Register . . . . .	46.45	34.15	12.30	26.48
45% Register . . . . .	45.70	34.22	11.48	25.12
45% Register . . . . .	47.98	35.75	12.23	25.49
45% Register . . . . .	45.00	34.19	10.81	24.00
Average . . . . .	46.59	34.65	11.93	25.59
Bone Scrap . . . . .	36.60	30.26	6.34	17.32
<b>N. Roy &amp; Son</b>				
Steamed Meat and Bone . . .	54.55	42.66	11.89	21.80
<b>Springfield Rendering Co.</b>				
Brightwood Special . . . . .	60.94	44.02	16.92	27.77
Brightwood Special . . . . .	63.35	43.78	19.57	30.57
Average . . . . .	62.15	43.90	18.25	29.17
50% . . . . .	52.19	37.43	14.76	28.28
50% . . . . .	50.00	35.76	14.24	28.48
Average . . . . .	51.20	36.60	14.50	28.38
45% . . . . .	46.67	36.20	10.47	22.43
45% . . . . .	45.09	38.60	6.49	14.39
45% . . . . .	45.49	38.08	7.41	16.29
Average . . . . .	45.75	37.63	8.12	17.70
<b>Syracuse Rendering Co.</b>				
45% . . . . .	46.40	37.68	8.72	18.79
<b>Van Iderstine Co.</b>				
VICO . . . . .	56.39	36.71	19.68	34.90
<b>Worcester Rendering Co.</b>				
55% . . . . .	58.06	43.89	14.17	24.41
55% . . . . .	56.21	39.81	16.40	29.18
Average . . . . .	57.14	41.85	15.29	26.80

In connection with obtaining data on the water soluble portion of the protein of meat scraps sold in the Massachusetts markets, analyses were also made of the fish products officially collected in 1933. It should be understood, however, that the experimental work in Indiana applied to meat products alone and may or may not apply to fish residues. The data are presented merely as a matter of record, and conclusions should not be drawn unless substantiated by experimental proof.

### Water Soluble Protein of Fish Meals.

Manufacturer and Brand.	Total Protein Per Cent.	Insoluble Protein Per Cent.	Soluble Protein Per Cent.	Percentage of Total Protein Soluble.
<b>Flag Fish Meal Co.</b>				
Flag Fish Meal . . . . .	67.52	36.41	31.11	46.08
Flag Fish Meal . . . . .	68.22	42.06	26.16	38.35
Average . . . . .	67.87	39.24	28.64	42.22
<b>John C. Dow Co.</b>				
Fish Meal . . . . .	66.64	36.66	29.98	44.99
<b>Gorton-Pew Fisheries Co.</b>				
Cod Fish Meal . . . . .	56.92	48.22	8.70	15.28
Cod Fish Meal . . . . .	57.23	50.44	6.79	11.86
Cod Fish Meal . . . . .	59.72	55.17	4.52	7.57
Average . . . . .	57.96	51.28	6.67	11.57
<b>Maine Fish Meal Co.</b>				
Maine Fish Meal . . . . .	56.39	46.11	10.28	18.23
Maine Fish Meal . . . . .	58.98	48.62	10.36	17.57
Average . . . . .	57.69	47.37	10.32	17.90
Sardine Fish Meal . . . . .	58.06	47.01	11.05	19.03
Sardine Fish Meal . . . . .	58.58	49.70	8.88	15.16
Sardine Fish Meal . . . . .	57.79	48.45	9.34	16.16
Sardine Fish Meal . . . . .	57.97	49.70	8.27	14.27
Average . . . . .	58.10	48.72	9.39	16.16
<b>Jas. F. Morse Co.</b>				
Fish Meal . . . . .	63.97	40.32	23.65	36.97
<b>New England Rendering Co.</b>				
Cod and Haddock . . . . .	67.13	42.40	24.73	36.89
<b>Portsmouth Fisheries Feeders Special</b>	63.13	59.30	3.83	6.07
<b>John Reardon &amp; Sons Co.</b>				
Cod and Haddock . . . . .	67.69	41.72	25.97	38.37
Cod and Haddock . . . . .	60.42	36.53	23.89	39.54
Cod and Haddock . . . . .	65.77	41.73	24.04	36.55
Cod and Haddock . . . . .	68.22	42.26	25.96	38.05
Average . . . . .	65.65	40.56	24.97	38.13
<b>Chas. M. Struven Co.</b>				
Fish Meal . . . . .	57.79	39.23	18.56	32.12
<b>Wilmington Packing Co.</b>				
White Fish Meal . . . . .	66.34	43.26	23.08	34.79
White Fish Meal . . . . .	61.82	44.12	17.70	28.63
Average . . . . .	64.08	43.69	20.39	31.71

A wide range in the water soluble protein content of these products is shown, due no doubt to several causes, prominent among which would probably be the kind of fish from which the material was derived. It might also depend upon whether the whole fish or only a part was used. The fish meals containing the lowest amounts of water soluble protein are probably glue residues.

Investigation which parallels that on meat products in Indiana should prove advantageous, as the fish meals vary to a greater extent in water soluble protein than do meat scrap and meat tankage.

**Average Analyses and Retail Ton Prices of Unmixed By-Products**  
**(September 1, 1932, to April 1, 1933)**

FEEDSTUFFS.	Number of Sam- ples.	Water (Per Cent.)	Pro- tein (Per Cent.)	Fat (Per Cent.)	Nitro- gen Free Ex- tract (Per Cent.)	Fiber (Per Cent.)	Ash (Per Cent.)	Price Per Ton.
Cottonseed Meal . . . . .	51	7.0	41.7	6.9	28.6	9.4	6.4	\$29 24
Linseed Meal . . . . .	27	8.4	36.8	5.5	36.4	7.2	5.7	35 40
Gluten Meal . . . . .	16	8.4	43.8	1.6	42.1	2.3	1.8	28 31
Gluten Feed . . . . .	35	10.1	27.2	2.3	48.0	6.6	5.8	24 24
Wheat Standard Middlings . . .	40	9.5	18.3	5.4	54.7	7.2	4.9	21 97
Wheat Flour Middlings . . .	12	9.6	17.9	5.0	58.4	5.2	3.9	21 20
Red Dog Flour . . . . .	10	10.0	18.4	4.4	61.9	2.5	2.8	27 17
Wheat Mixed Feed . . . . .	60	9.5	17.0	4.6	57.7	6.5	4.7	24 23
Wheat Bran . . . . .	74	9.0	16.7	4.8	53.9	9.3	6.3	21 81
Rye Feed . . . . .	5	9.4	17.1	3.2	62.7	4.3	3.3	20 13
Corn Meal. . . . .	23	10.9	9.6	4.4	71.9	1.7	1.5	21 62
Ground Oats . . . . .	30	8.6	12.4	4.4	60.7	10.5	3.4	25 84
Hominy Feed . . . . .	30	8.9	11.5	7.0	66.3	3.7	2.6	22 73
Dried Beet Pulp . . . . .	13	8.3	9.2	0.6	59.4	19.5	3.0	28.55

### Directory of Manufacturers Who Registered Feeding Stuffs for Sale in Massachusetts in 1933

- Albers Bros. Milling Co., Seattle, Wash. (Registered by Carnation Co.)  
 Allied Mills, Inc., Chicago, Ill.  
 Amendt Milling Co., Monroe, Mich.  
 American Maize-Products Co., 100 East 42nd St., New York, N. Y.  
 A. P. Ames Co., 10 Walnut St., Peabody, Mass.  
 Anchor Mills, Hagerstown, Md.  
 Anheuser-Busch, Inc., St. Louis, Mo.  
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.  
 Archer-Daniels-Midland Co., Minneapolis, Minn.  
 Ashcraft-Wilkinson Co., Atlanta, Ga.  
 Associated Milling Co., 140 Front St., San Francisco, Cal.  
 Atkinson Milling Co., Minneapolis, Minn.  
 E. W. Bailey & Co., Montpelier, Vt.  
 Barber & Bennett, Inc., Albany, N. Y.  
 Beacon Milling Co., Inc., Cayuga, N. Y.  
 Berkshire Coal & Grain Co., North Adams, Mass.  
 Bisbee Linseed Co., Philadelphia, Penn.  
 Black Rock Milling Corp., 356 Hertel Ave., Buffalo, N. Y.  
 Blatchford Calf Meal Co., Waukegan, Ill.  
 Blatz Brewing Co., Milwaukee, Wis.  
 Bolduc & Sons, New Bedford, Mass.  
 Borden Grain Co., Taunton, Mass.  
 Borden Sales Co., Inc., 350 Madison Ave., New York, N. Y.  
 C. W. Brister & Son, Auburn, N. Y.  
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Company of North America.)  
 Brown & Bailey Condensed Milk Co., Nevins & Butler Streets, Brooklyn, N. Y.  
 George B. Brown, Ipswich, Mass.  
 Buckeye Cotton Oil Co., Cincinnati, Ohio.  
 C. E. Buell, Inc., 6 Beacon St., Boston, Mass.  
 C. W. Burckhalter, Inc., 177 Franklin St., New York, N. Y.  
 Butman Grain & Feed Co., Lynn, Mass.  
 Cairo Meal & Cake Co., Cairo, Ill.  
 Caledonia Mills, Inc., St. Johnsbury, Vt.  
 A. B. Caple Co., Station A, Box 27, Toledo, Ohio.  
 Carnation Co., Oconomowoc, Wis. (Registered for Albers Bros. Milling Co.)  
 Clinton Corn Syrup Refining Co., Clinton, Iowa.  
 Coles Co., Middletown, Conn.  
 Collis Products Co., St. Paul, Minn.  
 Commander-Larabee Corp., Minneapolis, Minn.  
 Community Feed Stores, Inc., South Deerfield, Mass.  
 G. E. Conkey Co., Cleveland, Ohio.  
 Consolidated Feed & Grain Co., Inc., 910-916 Chamber of Commerce Bldg., Buffalo, N. Y.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Copeland Flour Mills Ltd., Midland, Ont., Canada.  
 Corn Products Refining Co., 17 Battery Place, New York, N. Y.  
 Nicolas Courcy Grain Co., 11 Waverly St., Taunton, Mass.  
 Cover & Palm Co., 150 Middle St., Lowell, Mass.  
 E. A. Cowee Co., Fitchburg, Mass.  
 Chas. M. Cox Co., Boston, Mass. (Registered for Ogilvie Flour Mills Co., Ltd.)  
 Crosby Milling Co., Brattleboro, Vt.  
 Curley Brothers, Main St. & North Ave., Wakefield, Mass.  
 Cutler Co., North Wilbraham, Mass. (Registered by St. Albans Grain Co.)  
 John W. Day, 295 Maple St., Lynn, Mass.  
 Decatur Milling Co., Inc., Decatur, Ill.  
 Delaware Mills, Inc., Deposit, N. Y.  
 Denver Alfalfa Milling & Products Co., Lamar, Col.  
 Frank Diauto, Randolph, Mass.  
 Albert Dickinson Co., 35th St. at California Ave., Chicago, Ill.  
 F. Diehl & Son, Inc., Wellesley, Mass.  
 Dietrich & Gambrill, Inc., Frederick, Md.  
 Donahue-Stratton Co., 414 Mitchell Bldg., Milwaukee, Wis.  
 Dreyer Commission Co., 300 Merchants Exchange Bldg., St. Louis, Mo.  
 Duluth-Superior Milling Co., Minneapolis, Minn.  
 J. L. Dunnell & Son, Bernardston, Mass.  
 Eagle Roller Mill Co., New Ulm, Minn.  
 East Bridgewater Farmers Co-operative Exchange, East Bridgewater, Mass.  
 Eastern Grain Co., Bridgewater, Mass.  
 Eastern States Farmers' Exchange, Springfield, Mass.  
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago, Ill.  
 Michael W. Ellis, 19 Walnut St., Peabody, Mass.  
 Elm City Creamery, Inc., 3 Pleasant St., Fairhaven, Mass.  
 Elmore Milling Co., Inc., Oneonta, N. Y.  
 John W. Eshelman & Sons, Lancaster, Penn.  
 Evans Milling Co., Indianapolis, Ind.  
 Excelsior Milling Co., 712 Flour Exchange, Minneapolis, Minn.  
 Fairchild Milling Co., 1635 Merwin St., Cleveland, Ohio.  
 Fairmont Creamery Co., Omaha, Neb.  
 Farm Service Stores, Inc., Industrial Bldg., Boston, Mass.  
 Farmers Wholesale Co., Inc., 661 New Chamber of Commerce, Minneapolis, Minn. (Registered for J. B. Ham Co.)  
 Federal Mill, Inc., Lockport, N. Y.  
 Fernando Valley Milling & Supply Co., 336 I. W. Hellman Bldg., Los Angeles, Cal.  
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.  
 Flag Fish Meal Co., 108 South St., New York, N. Y.  
 Flory Milling Co., Inc., Bangor, Penn.  
 J. A. Forrest, 819 Security Bldg., Minneapolis, Minn. (Registered for Lake of the Woods Milling Co., Ltd.)  
 Fred A. Fountain, 355 Tremont St., Taunton, Mass.

Dean S. French, West Stoughton, Mass.  
 J. B. Garland & Son, Worcester, Mass.  
 General Commodity Corp., Buffalo, N. Y.  
 General Mills, Inc., Chamber of Commerce Bldg., Minneapolis, Minn.  
 W. K. Gilmore & Sons, Inc., Walpole, Mass.  
 Frank A. Goode, 452 Broadway, Lowell, Mass.  
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.  
 Grand Union Co., 233 Broadway, New York, N. Y.  
 D. H. Grandin Milling Co., Jamestown, N. Y.  
 Great Atlantic & Pacific Tea Co., New York, N. Y.  
 Hales & Hunter Co., 166 West Jackson Blvd., Chicago, Ill.  
 Hall Milling Co., 518 Merchants Exchange, St. Louis, Mo.  
 Frank B. Ham & Co., Ltd., 1506 Royal Bank Bldg., Toronto 2, Ont., Canada.  
 J. B. Ham Co., Auburn, Maine. (Registered by Farmers Wholesale Co.)  
 Wm. Hamilton & Son, Inc., Caledonia, N. Y.  
 Dwight Hamlin Co., 1005 Diamond Bank Bldg., Pittsburgh, Penn.  
 D. Harbeck, 405 Earle St., New Bedford, Mass.  
 Hecker-H-O Co., Inc., Buffalo, N. Y.  
 Hecker-Jones-Jewell Milling Div. of Standard Milling Co., 503 Seneca St., Buffalo, N. Y.  
 W. D. Higgins Co., Framingham, Mass.  
 Hirst & Begley Linseed Works, 2013 Mendel St., Chicago, Ill.  
 D. B. Hodgkins' Sons, Gloucester, Mass.  
 D. B. Hodgkins' Sons, Manchester, Mass.  
 R. B. Howlett, Amherst, Mass.  
 Horvitz Grain Co., 742 Acushnet Ave., New Bedford, Mass.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 International Milling Co., Minneapolis, Minn.  
 International Vegetable Oil Co., Inc., Augusta Rd., Savannah, Ga.  
 Jaquith & Co., Woburn, Mass.  
 Jersee Co., Minneapolis, Minn.  
 Joslin-Schmidt Corp., Cincinnati, Ohio.  
 Kansas Flour Mills Corp., Kansas City, Mo.  
 Kellogg Co., Battle Creek, Mich.  
 Kelloggs & Miller, Inc., Amsterdam, N. Y.  
 Spencer Kellogg & Sons, Inc., Buffalo, N. Y.  
 Kerr Chickeries, Inc., Frenchtown, N. J.  
 H. H. King Flour Mills Co., Minneapolis, Minn.  
 King Midas Mill Co., Minneapolis, Minn.  
 Chas. A. Krause Milling Co., Milwaukee, Wis.  
 Vincent E. Kyle, 21 Water St., Haverhill, Mass.  
 Lake County Oil Mill, Tiptonville, Tenn.  
 Lake of the Woods Milling Co., Ltd., Montreal, Canada. (Registered by J. A. Forrest.)  
 J. T. Lampman & Co., Claverack, N. Y.  
 Land O'Lakes Creameries, Inc., Minneapolis, Minn.  
 Larabee Flour Mills Co., Kansas City, Mo.  
 Larowe Milling Co., Box 68, North End Sta., Detroit, Mich.  
 L. B. Lovitt & Co., Memphis, Tenn.  
 Maine Fish Meal Co., Portland, Maine.  
 Mann Bros. Co., Buffalo, N. Y.  
 Mansfield Milling Co., Mansfield, Mass.  
 Maple Leaf Milling Co., Ltd., Toronto, Ont., Canada. (Registered by Traders Feed & Grain Co.)  
 Marianna Sales Co., Memphis, Tenn.  
 Maritime Milling Co., Inc., Buffalo, N. Y.  
 Matheson Vail Co., 177 Milk St., Boston, Mass.  
 Mellin's Food Company of North America, 177 State St., Boston, Mass. (Registered for A. H. Brown & Bros.)  
 Merrimack Farmers' Exchange, Inc., Concord, N. H.  
 Midland Flour Milling Co., Kansas City, Mo.  
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.  
 Monti-Van Iderstine, Inc., 272 Hudson Ave., Brooklyn, N. Y.  
 Geo. Q. Moon & Co., Inc., 201 Chenango St., Binghamton, N. Y.  
 Jas. F. Morse & Co., Somerville, Mass.  
 Moseley & Motley Milling Co., Mill St., foot of Brown St., Rochester, N. Y.  
 National Milling Co., Toledo, Ohio.  
 Nebraska Consolidated Mills Co., Omaha, Neb. (Registered by J. C. Shaffer Grain Co.)  
 New England Rendering Co., Brighton, Mass.  
 New Orleans Export Co., Ltd., New Orleans, La.  
 Niagara Falls Milling Co., Lockport, N. Y.  
 Northern Illinois Cereal Co., Lockport, Ill.  
 Northwestern Consolidated Milling Div. of Standard Milling Co., Minneapolis, Minn.  
 Nowak Milling Corp., Hammond, Ind.  
 Ogden Grain Co., Utica, N. Y.  
 Ogilvie Flour Mills Co., Ltd., Montreal, Canada. (Registered by Chas. M. Cox Co.)  
 Ontario Milling Co., Inc., Oswego, N. Y.  
 Thomas Page Mill Co., North Topeka, Kan.  
 Philip R. Park, Inc., Naval Station, San Pedro, Cal.  
 Park & Pollard Co., 356 Hertel Ave., Buffalo, N. Y.  
 George H. Parker Grain Co., Danvers, Mass.  
 Patent Cereals Co., Geneva, N. Y.  
 Pecos Valley Alfalfa Mill Co., Hagerman, N. M.  
 Penick & Ford Ltd., Inc., Cedar Rapids, Iowa.  
 Perkins Oil Co., Inc., 727 Beale Ave., Memphis, Tenn.  
 Pillsbury Flour Mills Co., Minneapolis, Minn.  
 Maurice Pincoffs Co., 421 Cotton Ex., Houston, Texas.  
 Postum Co., Inc., Battle Creek, Mich.  
 W. N. Potter Grain Stores, Inc., Greenfield, Mass.  
 Pratt Food Co., Inc., 1300 Chamber Commerce Bldg., Buffalo, N. Y.  
 H. C. Puffer Co., Springfield, Mass.  
 Quaker City Flour Mills Co., 3042 Market St., Philadelphia, Penn.  
 Quaker Oats Co., 141 West Jackson Blvd., Chicago, Ill.  
 Ralston Purina Co., St. Louis, Mo.

John Reardon & Sons Co., Cambridge, Mass.  
 James Richardson & Sons, Ltd., Montreal, Canada.  
 Robin Hood Mills, Ltd., Moose Jaw & Calgary, Canada.  
 Ronck & Bevis Co., 940 North Front St., Philadelphia, Penn.  
 Reuben W. Ropes, 5 Hobart St., Danvers, Mass.  
 N. Roy & Son, South Attleboro, Mass.  
 Russell-Miller Milling Co., Minneapolis, Minn.  
 Ryther & Warren, Belchertown, Mass.  
 St. Albans Grain Co., St. Albans, Vt. (Registered also for Cutler Co.)  
 St. Lawrence Flour Mills Co., Ltd., 2110 Nctre Dame St. West, Montreal, Canada.  
 J. C. Shaffer Grain Co., 406 Merchants Exchange Bldg., St. Louis, Mo. (Registered for Nebraska Consolidated Mills Co.)  
 Sheffield Farms Co., Inc., 524-528 West 57th St., New York, N. Y.  
 Shellabarger Grain Products Co., Decatur, Ill.  
 Sherwin Williams Co., 101 Prospect Ave., Cleveland, Ohio.  
 Smith Bodfish Swift Co., Vineyard Haven, Mass.  
 James H. Smith, 102 Hale St., Haverhill, Mass.  
 Southland Cotton Oil Co., Paris, Texas.  
 Soya Products, Inc., Chicago, Ill.  
 A. E. Staley Manufacturing Co., Decatur, Ill.  
 D. A. Stickell & Sons, Inc., Hagerstown, Md.  
 F. W. Stock & Sons, Hillsdale, Mich.  
 Stratton & Co., Concord, N. H.  
 Swift & Co., Union Stock Yards, Chicago, Ill.  
 C. H. Symmes, Winchester, Mass.  
 Syracuse Milling Co., P. O. Box 1141, Syracuse, N. Y.  
 Tioga-Empire Feed Mills, Inc., Waverly, N. Y.  
 Torrence, Vary Co., 45 Alley St., Lynn, Mass.  
 Traders Feed & Grain Co., Inc., 736 Chamber Commerce, Buffalo, N. Y. (Registered for Maple Leaf Milling Co., Ltd.)  
 Transit Milling Co., Galveston, Texas.  
 Twin City Milk Producers Association, 2395 University Ave., St. Paul, Minn.  
 Union Starch & Refining Co., Columbus, Ind.  
 United Co-Operative Farmers, Inc., Fitchburg, Mass.  
 United Mills Co., Inc., Grafton, Ohio.  
 United Milling Corp., Roscoe, Cal.  
 Upper Hudson Rye Flour Mills, Inc., 7 Madison St., Troy, N. Y.  
 George Urban Milling Co., Buffalo, N. Y.  
 Van Iderstine Co., Long Island City, N. Y.  
 Victor Flour Mills, Inc., Pittsford, N. Y.  
 Ward Dry Milk Co., St. Paul, Minn.  
 C. P. Washburn Co., Middleboro, Mass.  
 Wayne County Grangers Feed Corp., Clyde, N. Y.  
 H. K. Webster Co., Lawrence, Mass.  
 West-Nesbitt, Inc., Oneonta, N. Y.  
 Whiting Milk Companies, 570 Rutherford Ave., Boston, Mass.  
 Williams Bros. Co., Kent, Ohio.  
 Est. M. G. Williams, Box 603, Taunton, Mass.  
 Wilmington Packing Co., New Boston St., Woburn, Mass.  
 Wilson & Co., Inc., 41st & Ashland Ave., Chicago, Ill.  
 Stanley Wood Grain Co., Taunton, Mass.  
 Worcester Grain & Coal Co., Worcester, Mass. (Registered one brand for Jersee Co.)

MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 71

DECEMBER, 1933

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Inspection of Agricultural  
Lime Products

By H. D. Haskins

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This is the twenty-second report on the inspection of agricultural lime products in Massachusetts. It gives the composition of the various products which have been sold, supplemented by comparative costs of units of effective oxides present. The use of the analytical data in estimating the most economical product to purchase is also given.

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Massachusetts State College  
Amherst, Mass.



# INSPECTION OF AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1933

By H. D. Haskins, Official Chemist.<sup>1</sup>

## Manufacturers and Brands.

During 1933, twenty-four firms registered for sale in Massachusetts thirty-nine brands of agricultural lime and one of gypsum or land plaster. The products are grouped as follows:

Hydrated or slaked lime	17
Ground limestone,	19
* Lime kiln ashes,	1
Oyster shell lime,	2
	<hr/>
	39
Gypsum	1

Every brand of agricultural lime registered has been analyzed and results appear in the appropriate table in this bulletin. The same inspectors sampled the lime products who were employed in drawing samples of fertilizers. In this manner the state is quite thoroughly covered and the results of inspection should give a fair picture of the quality of the lime products used as soil amendments. A total of 66 samples was drawn from stock found in the possession of 59 agents or owners.

## Variations and Deficiencies in the Composition of Lime Products.

Two brands of hydrated lime were a little deficient in calcium oxide: the "Sweet-Arrow" hydrate manufactured by H. E. Millard, and R-R Land Lime manufactured by the Rockland & Rockport Lime Corp. In both cases, however, the neutralizing effect of the magnesium oxide overruns more than balanced the small deficiencies of calcium oxide so there was no commercial shortage.

The Red Top Hydrated Lime registered by the United States Gypsum Co. had a deficiency of 4.45 per cent calcium oxide and an overrun of 1.4 per cent of magnesium oxide; this, changed to calcium oxide equivalent ( $1.4 \times 1.39$ ), would give 1.95 per cent, leaving a deficiency of 2.5 per cent calcium oxide, or 50 pounds in one ton. It would appear that the calcium oxide guarantee on this brand (75%) was somewhat high, as pure hydrated lime can contain only 75.7 per cent calcium oxide. No other serious deficiencies were noted in this table.

No serious deficiencies occurred in the ground limestone products listed in Table II; small deficiencies noted either in calcium oxide or in magnesium oxide were more than made up by overruns in the other ingredient so that the neutralizing value of the brand was not lessened.

## Purchase of Lime Products.

In using the tables of analyses for the selection of liming materials, quotations should be secured on the basis of delivered cost at the nearest railroad station or, in case of truck delivery, at the farm. This ton cost should then be divided by the number of hundred pounds of calcium oxide equivalent in one ton of the product as given in the analysis tables. This will give the cost of 100 pounds of effective oxides delivered. Example: A lime product is quoted at \$4.25

<sup>1</sup>Assisted by H. Robert DeRose, and John W. Kuzmeski, Chemists; James T. Howard, C. L. Whiting, A. G. Brigham and G. E. Taylor, Sampling Agents.

per ton f.o.b. plant; the freight to point of destination is \$2.75; and the product contains about 1,100 pounds of effective oxides per ton, as shown by analysis.  $\$4.25 + \$2.75 = \$7.00 \div 11.00 = 63.6$  cents, which is the cost of 100 pounds of effective oxides.

### Explanation of Tables of Analyses.

Table I, "Proportion of total oxides as carbonates." The data furnished in this column are calculated from an actual determination of carbon dioxide ( $\text{CO}_2$ ). Calcium or magnesium not in the form of carbonate is present either as hydrated lime (water- or air-slaked) or as burned lime (caustic or unslaked). It should be understood that all of the products listed in this table have at some time been burned, and the proportion of oxides present as carbonates indicates to what extent the product has absorbed carbonic acid from the air.

"Calcium oxide equivalent" represents the acid neutralizing value of both the magnesium and calcium, expressed in terms of calcium oxide. The figures in the "per cent" column are obtained by multiplying the magnesium oxide by the factor 1.39 and adding the calcium oxide; or they may be obtained by a direct titration with standard acid. All samples are checked by both methods in this laboratory. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20. The "cost of 100 pounds" is based on prices furnished by the producers.

Table II, "Calcium oxide equivalent: per cent and pounds in one ton." In securing these data the degree of fineness to which the limestone has been ground is taken into consideration. On those products which are finely ground so that all of the material will pass through a 20-mesh sieve, it is assumed that all of the calcium and magnesium oxides will become available in the soil within a five-year period. On those products which will not wholly pass a 20-mesh sieve, it is assumed that the oxides in that portion which is coarser than 20-mesh will be only 50 per cent effective during the same period. The magnesium oxide found is multiplied by the factor 1.39 and added to the calcium oxide in estimating the calcium oxide equivalent.

In the column headed "Carbonates of calcium and magnesium" the calculation allows for the small amounts of calcium and magnesium combined as basic silicates; these are readily soluble in mineral acid solutions but obviously should not be classed as carbonates.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass the various meshed sieves mentioned.

In both tables the figures in parenthesis following the brand name show the number of samples collected and analyzed.

Table I. Hydrated or Slaked Lime and Lime Ashes.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		Proportion of Total Oxides as Carbonates.	CALCIUM OXIDE EQUIVALENT.		
	Found.	Guaranteed.	Found.	Guaranteed.		Per Cent.	Pounds in One Ton.	Cost of 100 Pounds.
Brewer & Co., Inc., 45 Arctic St., Worcester, Mass. (a)								
Producto Agricultural Hydrated Lime (1)	67.37	60.00	1.23	1.00	1/8	69.08	1382	\$0.54
Lime Kiln Ashes (1)	49.02	42.00	3.68	none	4/5	54.14	1083	.74
Producto Agricultural Lime (1)	73.47	60.00	7.50	1.00	1/20	83.90	1678	.30
Eastern States Farmers' Exchange, Springfield, Mass.								
Eastern States Agricultural Hydrated Lime (1)	71.95	68.00	1.01	.20	1/17	73.35	1467	.60
Eastern States Agricultural Hydrated Lime (1)	71.00	70.00	1.20	.20	1/50	72.67	1453	.60
Burton K. Harris, Saylesville, R. I. (b)								
Dexter Agricultural Lime (1)	50.88	50.00	25.53	20.00	1/25	86.37	1727	.70
Hoosac Valley Lime Co., Inc., Adams, Mass.								
Adams Land Lime (1)	64.75	58.00	1.41	.50	1/6	66.71	1334	.41
Lawrence Portland Cement Co., Thomaston, Maine.								
Dragon Mainrok Agricultural Hydrated Lime (4)	71.16	68.00	.96	.20	1/9	72.49	1450	.34
Dragon Mainrok Agricultural Hydrated Lime (1)	71.49	68.00	1.16	.20	1/10	73.10	1462	.34
Lee Lime Corp., Lee, Mass.								
Lee Agricultural Hydrated Lime (2)	47.85	47.00	33.13	31.00	1/33	93.90	1878	.40
H. E. Millard, Annville, Penn.								
"Sweet-Arrow" Hydrated Lime (1)	68.58	70.00	2.69	1.50	1/8	72.32	1446	.83
New England Lime Co., Pittsfield, Mass. (c)								
Agricultural Hydrated Lime (Adams) (1)	69.76	50.00	1.48	1.50	1/14	71.82	1436	.50
Agricultural Hydrated Lime (Canaan) (1)	44.44	40.00	30.21	15.00	1/11	86.43	1729	.42
Rockland & Rockport Lime Corp., Rockland, Maine								
R-R Land Lime, Grade C (1)	60.82	60.00	2.86	.50	1/7	64.80	1296	-
R-R Land Lime, Grade M (1)	59.12	60.00	4.66	4.00	1/4	65.60	1312	-
Sanlime (1)	73.10	70.00	1.10	.20	1/33	74.63	1493	-



Table II. Ground Limestone and Oyster Shell Lime.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		CARBONATES OF CALCIUM AND MAGNESIUM.		CALCIUM OXIDE EQUIVALENT			MECHANICAL ANALYSIS (PER CENT)				
	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Per Cent.	Pounds in 1 Ton.	Cost of 100 Pounds.	Finer than 100-mesh.	Between 100 and 80-mesh.	Between 80 and 60-mesh.	Between 60 and 40-mesh.	Between 40 and 20-mesh.
Allyn & Allyn, East Canaan, Conn. Allydale Agricultural Limestone (1)	32.35	30.00	22.23	21.00	89.70	99.00	63.25	1,265	\$1.266	38.34	3.30	13.60	12.62	32.14
American Agricultural Chemical Co., North Weymouth, Mass. Fine Ground Limestone (2) (b) Pownal Agricultural Limestone (3) (c)	30.33 47.19	30.00 45.00	20.99 6.24	19.00 5.00	94.98 91.49	93.29 90.00	59.51 55.86	1,190 1,117	.32 .34	86.77 91.12	3.06 1.80	6.12 5.27	2.82 4.50	1.23 7.31
Brewer & Co., Inc., 45 Arctic St., Worcester, Mass. Producto Agricultural Limestone (1) (d)	49.53	44.00	4.26	.50	94.08	90.00	55.45	1,109	.32	49.46	3.07	11.51	14.64	21.32
Dominion Lime Co., Lime Ridge, Que. Dudswell Pulverized Limestone (1) (e)	51.85	52.00	1.41	.20	94.04	94.00	53.81	1,076	.27	68.05	1.60	5.56	7.40	17.39
Eastern States Farmers' Exchange, Springfield, Mass. Eastern States Magnesian Limestone (4) (f)	30.63	29.50	20.86	20.50	92.70	95.00	59.63	1,193	.29	55.44	5.91	19.55	16.20	2.90
Grangers Manufacturing Co., West Stockbridge, Mass. Grangers Agricultural Limestone (1) (g)	39.35	35.00	9.03	1.00	87.95	90.00	51.90	1,038	— h	80.06	2.80	7.60	6.08	3.46
Hazen Bros., 14 Lake St., Arlington, Mass. High Grade Ground Limestone (4)	54.62	53.71	.78	.51	97.57	99.21	55.70	1,114	.36	44.21	2.85	14.67	16.60	21.67
Hoosac Marble Co., No. Adams, Mass. Ground Limestone (3)	53.18	50.00	1.01	.75	97.01	97.00	54.58	1,092	.36	94.58	1.72	3.28	.42	—
Hoosac Valley Lime Co., Inc., Adams, Mass. Hoosac Agricultural Limestone (1)	54.93	50.00	.67	.75	94.24	97.00	55.86	1,117	.34	40.16	3.32	11.84	14.38	30.30

[illegible]

*a*Delivered at Massachusetts points.

Plant at Ashley Falls, Mass.

Plant at North Pownal, Vt.

*d*Plant at Winooski, Vt.

a Plant at Winooski, Vt.  
e Plant at Dudswell Junction, Quebec, Canada.

*f*Plant at Falls Village, Conn.

Plant at West Stockbridge, Mass.

Delivered price \$6.40, o

*Delivered price \$6.40, 0*  
*Plant at Adams, Mass.*

**Plant at Adams**  
**No price given.**

No price given.  
Plant at Jamesville, N. Y.

Table III. Gypsum or Land Plaster.

Name of Manufacturer and Brand.	Calcium Oxide (CaO).		Calcium Sulfate (CaSO <sub>4</sub> ).		Calcium and Magnesium Carbonates Found.
	Found.	Guar- anteed.	Found.	Guar- anteed.	
United States Gypsum Co., 300 West Adams St., Chicago, Ill. Ben Franklin Agricultural Gypsum (1)	32.95	30.00	75.52	64.50	4.03

NOTE: The small amount of calcium and magnesium carbonates present in gypsum would, to a slight extent, neutralize sour soils: the calcium sulfate would not be effective for this purpose.

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# MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 72

FEBRUARY, 1934

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## Seed Inspection

By F. A. McLaughlin and Margaret E. Nagle

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This Report, the sixth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1933 by the Commissioner of Agriculture, who is named in the Act as Administrative Officer (Acts and Resolves of 1927, Chapter 274).

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.



## ANNOUNCEMENT

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any resident firm or citizen of Massachusetts. Work in excess of ten units and all work for non-residents will be charged for according to existing schedule. (See Circular, "How the Massachusetts Seed Law Operates," Massachusetts Agricultural Experiment Station Seed Inspection Service, October, 1927.)

Units are rated as follows:

	Units
Purity analysis (red clover, timothy, etc.) . . . . .	1
Purity analysis (bluegrass, orchard grass, etc.) . . . . .	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture) . . . . .	4 - 10
Examination for noxious weeds (4 oz. or fraction thereof) of samples not mixtures . . . . .	1
Examination for noxious weeds (4 oz. or fraction thereof) of mixtures . . . . .	4 - 10
Identification of seed or plant . . . . .	1
Cleaning tobacco seed (4 oz. or fraction thereof) . . . . .	2
Germination tests (4 x 100 seeds, of any seed not chaffy or requiring a purity test) . . . . .	1
Germination tests (soil, 2 x 100 seeds) . . . . .	1
Germination tests (chaffy grasses or seeds requiring purity analysis) . . . . .	2 - 4

# SEED INSPECTION

By F. A. McLaughlin and Margaret E. Nagle<sup>1</sup>

This bulletin gives the results of analysis of official seed samples, collected by the State Department of Agriculture during the year 1933 from the open markets in seventy-five towns and cities of Massachusetts, and analyzed at the Seed Testing Laboratory of the Massachusetts Agricultural Experiment Station at Amherst. Between October 1, 1932, and October 1, 1933, the Seed Laboratory analyzed 1188 samples, of which 507 were collected by the State Department of Agriculture, 180 submitted by dealers and farmers, and 191 by the Rhode Island Department of Agriculture; 266 were purchased from wholesalers for special tests; and the remaining 44 were accounted for in germination tests of ingredients of grass seed mixtures.

This bulletin also contains results of field tests for trueness to type of 280 samples of sweet corn, conducted by the Department of Vegetable Gardening, also notes on the relation of seed-borne diseases observed in laboratory germination of sweet corn to emergence in the field. Type and variety tests of legumes, conducted by the Department of Agronomy are recorded.

## SUMMARY OF RESULTS

### Alfalfa to Vetch

The following table of analysis covering the 145 samples of seed in this group shows that again, as in former years, the most common violation of the seed law is the lack of certain required information on the label. This information was lacking, wholly or in part, for 52 samples (35.86%). Other deficiencies shown are 33, or 22.80%, below in germination; 9, or 6.20%, with excessive weed seed; and 12, or 8.28%, below in purity. In all, 84 samples (57.93% of this group) either did not comply with the label requirements or were not up to guarantee, even when proper tolerance allowances were made.

### Mixtures of Not More Than Two Lots of Seeds

No samples declared as such were taken by inspectors. Two samples, however, sold for pure seed of a single kind, were found to be mixtures of two sorts of seed. The table shows them otherwise deficient.

### Special Mixtures

Thirty-eight samples were analyzed in this group. Twenty-one (52.63%) lacked the whole or part of the label. Eight samples (21.05%), though adequately labeled, were found to contain excessive weeds or inert material, or both. Certain other minor irregularities were found, but on the whole the quality of seed for this group appears to be fair to excellent.

### Vegetable Seed

A larger number of samples of vegetable seed were taken than formerly. Each of the 320 samples tested met the label requirements of the law. On the whole the quality of seed as shown by germination is above that of any previous collection of official samples tested in this laboratory; yet 119, or 37% of the samples, show germination below the standards required by law in many states (Seed Control Bulletin 56, 1930, page 4) and 55 of them (17%) are below Virginia state standards. While averaging better than formerly in germination, the record shows much to be desired in quality of many vegetable seeds sold in Massachusetts. One cause

<sup>1</sup> Miss Jessie L. Anderson served as seed analyst for a period of three months.

of the poor showing is the practice among retailers of offering for sale seed which has been in their possession for one or more years. Seeds of certain varieties may retain satisfactory viability for several years if properly stored, but other kinds lose a large part of their viability in one year. Where old seed is noted in the tables, we believe the wholesaler should be for the most part absolved from blame.

### Explanation of Tables

In these tables the seeds are listed in alphabetical order by groups, each group containing only those seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. Section 261-A of the Acts and Resolves of 1927, Chapter 274, defines the group from Alfalfa to Vetch, inclusive; Section 261-B, Mixtures; Section 261-C, Special Mixtures; and Section 261-D, Vegetables.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis. Attention is called to certain irregularities by the following:

The asterisk (\*) shows violation in labeling.

Boldface type indicates low purity, low germination, excessive weed seed, or excessive inert material, depending upon the column in which it is found.

Other deficiencies are enumerated as follows:

- (1) Noxious weeds found.
- (2) Old seed.
- (3) Ingredient found in excess of 5%, but not declared.
- (4) Ingredient declared, but not found.
- (5) Does not appear to be Chewings Fescue as labeled.
- (6) Bluegrass and White Clover declared, but not found.

The letter "R" after the germination percentage in the table of vegetable seeds indicates that one or more retests were made.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except in those tables which list seeds falling under sections of the law not requiring purity or germination on the label. For the application of "Purity Tolerance," the sample is considered as made up of two component parts: (1) the component being considered, and (2) the balance of the sample. The tolerance in percentage allowed for each component shall be two-tenths of one per cent (0.2%) plus twenty per cent (20%) of the lesser of the two parts. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

<i>Given Germination (%)</i>	<i>Allowable Variation (%)</i>
90 or over.....	6
80 or over, but less than 90.....	7
70 or over, but less than 80.....	8
60 or over, but less than 70.....	9
Less than 60.....	10

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>ALFALFA</b>							
A-88	JOSEPH BRECK & SONS CORP., Boston, Mass. Grimm Alfalfa.....	(L. 98.00 F. 99.31)	* .20	— .25	— .24	96 87-3	1/33 7/33
A-24	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Variegated Alfalfa.....	(L. 99.60 F. 99.83)	.06 .04	.18 .04	.16 .09	85-6 82-7	11/32 5/33
A-27	K. & A. SEED CO., Harrisburg, Pa. Grimm Alfalfa, Lot No. AA, Lot B-27.....	(L. 99.60 F. 99.66)	.14 .06	— .24	— .04	80-14 80-10	1/33 5/33
A-60	ROSS BROS. CO., Worcester, Mass. Grimm Alfalfa.....	(L. 99.50 F. 99.79)	.10 .02	— .11	— .08	93 78-10	2/33 7/33
A-3	N. WERTHEIMER & SONS, Buffalo, N. Y. Grimm Alfalfa, Lot No. 31605.....	(L. 99.00 F. 98.70)	.36 .61	.52 .55	.12 .14	84.49 77-2	2/32 5/33
A-115	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Alfalfa.....	(L. 99.25 F. 99.34)	.22 .10	— .21	— .35	85-17 83-8	2/33 7/33
<b>BARLEY</b>							
A-42	BARBER & BENNETT, INC., Albany, N. Y. Six-Row Barley, Lot No. 679.....	(L. 99.00 F. 99.60)	* .04	— .08	— .28	95 98	3/33 6/33
A-52	CRAYER-DICKINSON SEED CO., Buffalo, N. Y. Six-Row Barley.....	(L. 98.00 F. 99.45)	.25 .06	— .17	— .32	95 90	3/32 7/33
A-56	ALBERT DICKINSON CO., Chicago, Ill. Six-Row Barley.....	(L. 98.09 F. 99.34)	.06 .00	— .29	— .37	94 81	2/33 6/33

Note:—The letters "L" and "p" indicate "Labeled" by the distributor and "Found" by the laboratory.

The \* shows the violation in labeling.

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>BARLEY—Continued</b>							
A-121	THOMAS W. EMERSON CO., Boston, Mass. Two-Row Barley..... Fales Grain Co., Norwood	(L. 98.50 (F. 98.35	.01 .57	— 1.08	— .00	93 95	* 6/33
A-109	JOSEPH BRECK & SONS CORP., Boston, Mass. Rhode Island Bent..... Geo. E. Warren, Brantree	(L. 98.00 (F. 89.94	* .11	— 9.95	— Trace	95 74	* 6/33
A-37	THOMAS W. EMERSON CO., Boston, Mass. South German Mixed Bent..... Frank Howard, Inc., Pittsfield (Colonial Bent)	(L. 89.00 (F. 90.53	* .18	— 9.01	— .28	90 72	*/33 6/33
A-94	THOMAS J. GREY CO., Boston, Mass. Seaside Creeping Bent..... Thomas J. Grey Co., Boston	(L. 99.00 (F. 99.51	— .00	— .49	— .00	90 77	9/32 6/33
A-59	ROSS BROS. CO., Worcester, Mass. Rhode Island Bent (Asortia)..... Ross Bros. Co., Worcester (Astoria Colonial Bent)	(L. 99.70 (F. 97.99	.05 .03	— 1.98	— —	96 91	12/32 6/33
A-143	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. German Bent..... H. V. Lawrence, Falmouth (South German Mixed Bent, containing some Seaside Bent)	(L. 78.23 (F. 88.67	.56 .42	— 10.81	— .10	80 73	2/33 6/33
<b>BLUEGRASS</b>							
A-40	THOMAS W. EMERSON CO., Boston, Mass. Canada Bluegrass (1)..... Frank Howard, Inc., Pittsfield	(L. 88.00 (F. 88.23	1.25 .20	— 7.81	— 3.76	78 78	2/33 6/33
A-100	JOSEPH BRECK & SONS CORP., Boston, Mass. Kentucky Bluegrass (2)..... Kingston Hardware Co., Kingston	(L. * (F. 89.13	* .20	— 10.58	— .09	* 18	* 6/33
A-49	ALBERT DICKINSON CO., Chicago, Ill. Kentucky Bluegrass, Lot No. 032388..... Berkshire Coal and Grain Co., North Adams	(L. 79.88 (F. 80.87	1.00 .75	— 18.29	— .09	72 63	1/33 6/33

## BLUEGRASS—Continued

A-86	PERRY SEED CO., Boston, Mass. Kentucky Bluegrass..... Perry Seed Co., Boston	(L. (F.	80.00 80.69	*	.41	—	18.90	Trace	80 72	3/33 6/33
A-6	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Kentucky Bluegrass..... Carlisle Hardware Co., Springfield	(L. (F.	87.00 87.17	.50 .28		—	12.55	.00	86 81	2/33 6/33
A-93	THOMAS J. GREY CO., Boston, Mass. Japanese Buckwheat..... Thomas J. Grey Co., Boston	(L. (F.	98.00 99.47	.50 .00		—	.40	2.00 .13	96 92	2/33 6/33
A-57	ALBERT DICKINSON CO., Chicago, Ill. Alsike Clover..... Pittsburg Hardware Co., Pittsburg	(L. (F.	95.70 95.03	.90 1.24		—	.21	3.52	83 71-17	9/32 5/33
A-12	Alsike Clover, Lot No. 21377..... H. C. Puffer Co., Springfield	(L. (F.	96.80 97.83	.30 .32		—	.21	1.64	84-9 85-9	11/32 5/33
A-90	THOMAS W. EMERSON CO., Boston, Mass. Alsike Clover..... Thomas W. Emerson Co., Boston	(L. (F.	97.95 97.74	.65 .41		—	.65	1.20	96 75-14	1/33 7/33
A-112	Alsike Clover (2)..... Williamson Bros., Somerset	(L. (F.	97.50 95.97	* .14		—	.04	3.85	96 67-2	8/31 6/33
A-28	K. & A. SEED CO., Harrisburg, Pa. Alsike Clover, Lot No. AA, B-50..... State College, Farm Department, Amherst	(L. (F.	99.00 99.25	.05 .05		—	.35	.35	82.5-11 78-14	12/32 5/33
A-1	N. WERTHEIMER & SONS Buffalo, N. Y. Alsike Clover, Matrix, Lot No. 31102..... Stevens Grain Co., Gt. Barrington	(L. (F.	98.75 98.29	.45 .59		.25 .34		.55 .78	90 82-11	2/32 5/33
A-45	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Alsike Clover..... L. P. Adams, Dalton	(L. (F.	97.62 97.52	.28 .35		—	.74	1.39	82-8 84-10	2/32 5/33
A-124	Alsike Clover..... John Shea, North Andover	(L. (F.	* 97.95	* .76		—	.32	.97	* 75-4	* 6/33

Note:—The letters "L" and "F" indicate "Labeled" by the distributor and "Found" by the laboratory.

The \* shows the violation in labeling. (1) 18 Canada Thistle per oz. in sample, (2) Old seed.

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>RED CLOVER</b>							
A-102	JOSEPH BRECK & SONS CORP., Boston, Mass. Red Clover..... Kingston Hardware Co., Kingston	(L. (P. 97.59	* .76	— .60	— 1.05	* 87-5	* 6/33
A-8	ALBERT DICKINSON CO., Chicago, Ill. Red Clover, Lot No. 24723..... H. C. Puffer Co., Springfield	(L. (P. 99.50 99.58	.16 .20	— .12	— .10	83-10 81-6	3/32 5/33
A-4	DOUGHTEN SEED CO., Syracuse, N. Y. Red Clover, Lot No. C643..... E. J. Adams & Son, Gt. Barrington	(L. (P. 99.52 99.46	.11 .24	.23 .06	.14 .24	85-7 91-4	4/32 5/33
A-136	THOMAS W. EMERSON CO., Boston, Mass. Red Clover..... H. T. Crocker, Brewster	(L. (P. 98.50 98.97	1.42 .91	— .08	— .04	95 90-5	3/33 6/33
A-127	Red Clover..... F. X. Robichaud, Methuen	(L. (P. 99.50 .42	1.42 .42	— .06	— .02	95 85-4	* 6/33
A-114	Red Clover (2)..... Williamson Bros., Somerset	(L. (P. 99.50 98.96	* .18	— .00	— .86	96 80-1	1/30 6/33
A-95	THOMAS J. GREY CO., Boston, Mass. Medium Red Clover..... Thomas J. Grey Co., Boston	(L. (P. 99.00 98.38	.32 .42	— .07	— 1.13	94 85-15	2/33 7/33
A-63	ROSS BROS. CO., Worcester, Mass. Medium Red Clover..... Ross Bros. Co., Worcester	(L. (P. 99.56 99.28	.04 .12	— .15	— .45	94 83-13	1/33 7/33
A-33	N. WERTHEIMER & SONS, Ligonier, Ind. Medium Red Clover, Lot No. 320..... W. N. Potter Grain Stores, Inc., Greenfield	(L. (P. 97.00 95.02	.20 .21	.30 .46	2.50 4.31	90 90-6	1/33 5/33
A-139	F. H. WOODRUFF & SONS, Milford, Conn. Red Clover..... Falmouth Plumbing & Hardware Co., Falmouth	(L. (P. * 98.75	* .37	— .41	— .47	* 83-10	* 6/33

## SWEET CLOVER

A-79	JOSEPH BRECK & SONS CORP., Boston, Mass. Sweet Clover, White..... Joseph Breck & Sons Corp., Boston	(L. (F.	97.00 99.47	— .23	— .21	90 75-7	10.32 7/33
A-22	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. White Blossom Sweet Clover..... Eastern States Farmers' Ex., Shelburne Falls	(L. (F.	99.45 99.67	.40 .15	.08 .14	83-4 85-3	11/32 5/33
A-64	ROSS BROS. CO., Worcester, Mass. Sweet Clover, White Annual..... Ross Bros. Co., Worcester	(L. (F.	99.50 99.33	— .37	— .06	93 91-3	1/33 7/33
WHITE CLOVER							
A-11	BARBER & BENNETT, INC., Albany, N. Y. White Clover, Lot No. 26-38..... H. C. Putter Co., Springfield	(L. (F.	98.62 98.63	— .28	— .66	76-15 87-13	11/32 5/33
A-89	HOVEY & CO., Boston, Mass. White Clover, Lot No. 6188..... Hovey & Co., Boston	(L. (F.	99.30 99.32	— .10	.50 .39	90-05 85-8	1/33 6/33
A-54	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. White Clover..... Davis Hardware Co., Gardner	(L. (F.	97.37 97.24	— .20	— 2.02	86 87-6	2/33 5/33
A-129	White Clover, Fancy Bulk, No. 2181..... Staples Hardware Co., Haverhill	(L. (F.	98.30 97.56	— .35	— .74	76-11 78-10	2/32 6/33
A-110	White Clover..... Geo. E. Warren, Braintree	(L. (F.	97.00 86.70	* .44	— 11.28	90 88-3	* 6/33
FIELD CORN							
A-78	JOSEPH BRECK & SONS CORP., Boston, Mass. Mondewin Field Corn..... Joseph Breck & Sons Corp., Boston	(L. (F.	98.00 99.83	— .16	— .01	98 94	2/33 7/33
A-147	ROSS BROS. CO., Worcester, Mass. Eurelia Corn..... P. A. Richards Hardware Co., Spencer	(L. (F.	99.00 99.98	— .02	— .00	98 94	1/33 7/33

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>FIELD CORN—Continued</b>							
A-131	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Excelsior Field Corn..... Staples Hardware Co., Haverhill	(L. 98.00 F.) 99.30	— .00	— .70	— .00	90 91	2/33 6/33
A-35	Improved Leaming Corn..... Community Feed Stores, Inc., Easthampton	(L. 98.00 F.) 99.67	— .00	— .33	— .00	90 88	2/33 6/33
A-16	Improved Leaming Corn..... R. B. Howlett, Amherst	(L. 98.00 F.) 99.79	— .00	— .21	— .00	90 89	2/33 6/33
<b>FESCUES</b>							
A-142	JOSEPH BRECK & SONS CORP., Boston, Mass. New Zealand Chewings Fescue..... H. V. Lawrence, Falmouth	(L. 97.00 F.) 97.81	* .23	— 1.31	— .65	85 45	*/33 6/33
A-91	THOMAS W. EMERSON CO., Boston, Mass. Chewings Fescue..... Thomas W. Emerson Co., Boston	(L. 98.08 F.) 98.32	* .05	— 1.49	— .14	92 13	1/33 6/33
A-122	Meadow Fescue..... F. W. Carson Hardware Co., Dedham	(L. * F.) 98.38	* 1.00	— .52	— .10	* 87	* 6/33
A-39	Meadow Fescue..... Frank Howard, Inc., Pittsfield	(L. 99.00 F.) 99.34	* .45	— .18	— .03	95 91	3/33 6/33
<b>MANGELS</b>							
A-99	JOSEPH BRECK & SONS CORP., Boston, Mass. Long Red Mangel..... Kingston Hardware Co., Kingston	(L. * F.) 99.12	* .14	— .74	— .00	* 81	* 6/33
A-82	Long Red Wurzel Beet Mangel..... Joseph Breck & Sons Corp., Boston	(L. 95.00 F.) 98.81	* .26	— .93	— .00	165 80	3/33 6/33
A-65	ROSS BROS CO., Worcester, Mass. Mammoth Long Red Mangel..... Ross Bros. Co., Worcester	(L. 99.83 F.) 98.11	.01 .00	— 1.89	— .00	87 89	2/33 6/33
A-135	Mammoth Long Red Mangel..... S. O. Simenson & Co., Barre	(L. * F.) 98.50	— .00	— 1.36	— .14	* 80	* 5/33

A-125	F. H. WOODRUFF & SONS, Milford, Conn. Mangel Beet..... John Shea, North Andover	(L. * P. 99.18	* .02	— .80	— —	* 70	* 6/33
<b>GERMAN MILLET</b>							
A-75	JOSEPH BRECK & SONS CORP., Boston, Mass. German Millet..... Joseph Breck & Sons Corp., Boston	(L. 98.00 P. 97.91	* 1.92	— .17	— .00	88 89	12/32 6/33
<b>GOLDEN MILLET</b>							
A-62	ROSS BROS. CO., Worcester, Mass. Tennessee Golden Millet..... Ross Bros. Co., Worcester	(L. 99.50 P. 99.55	.25 .22	— .23	— .00	92 90	2/33 5/33
<b>HUNGARIAN MILLET</b>							
A-36	BARBER & BENNETT, INC., Albany, N. Y. Hungarian Millet, Lot No. 47-520..... Easthampton Feed & Grain Co., Easthampton	(L. 99.68 P. 99.79	.16 .07	— .11	— .03	86 83	12/32 5/33
A-76	JOSEPH BRECK & SONS CORP., Boston, Mass. Hungarian Millet..... Joseph Breck & Sons Corp., Boston	(L. 99.00 P. 99.24	* .64	— .12	— —	85 85	11/32 6/33
A-145	Hungarian Millet..... Buzzards Bay Grain Co., Buzzards Bay	(L. 99.68 P. 99.03	* .10	— .27	— .60	88 81	* 6/33
A-58	ALBERT DICKINSON CO., Chicago, Ill. Hungarian Millet..... Fitchburg Hardware Co., Fitchburg	(L. 98.40 P. 97.60	.06 1.54	— .84	— .02	85 86	10/32 5/33
A-120	THOMAS W. EMERSON CO., Boston, Mass. Hungarian Millet..... Fales Grain Co., Norwood	(L. 99.60 P. 99.18	.10 .65	— .19	— .00	96 97	3/33 6/33
A-132	Hungarian Millet..... Staples Hardware Co., Haverhill	(L. * P. 99.63	* .20	— .15	— .02	* 89	* 6/33
A-19	K. & A. SEED COMPANY Hungarian Millet, Lot No. AA, Lot 3..... Sunshine Feed Co., Greenfield	(L. 98.19 P. 99.05	.55 .32	— .63	— .00	90 78	2/33 5/33

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>HUNGARIAN MILLET—Continued</b>							
A-15	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Hungarian Millet..... R. B. Howlett, Amherst	(L. 98.94 (F. 98.77	.67 .91	— .30	— .02	87 85	2/33 5/33
A-17	BARBER & BENNETT, INC., Albany, N. Y. Japanese Millet, Lot No. 4419..... Prentiss-Brooks & Co., Holyoke	(L. 98.53 (F. 98.26	1.42 1.73	— .01	— .00	92 86	1/33 5/33
A-128	THOMAS W. EMERSON CO., Boston, Mass. Japanese Millet..... F. X. Robichaud, Methuen	(L. 97.52 (F. 98.53	2.04 1.30	— .17	— .00	85 76	* 6/33
A-50	I. X. L. SEED CO., Elmira, N. Y. Japanese Millet..... Berkshire Coal & Grain Co., North Adams	(L. 97.06 (F. 96.99	2.66 2.71	.28 .30	— .00	95 96	1/33 6/33
A-20	K. & A. SEED CO., Harrisburg, Pa. Japanese Millet, Lot No. B1..... Sunshine Feed Co., Greenfield	(L. 96.13 (F. 92.05	1.93 1.71	— 2.66	— 3.58	85 70	3/33 5/33
A-85	PERRY SEED CO., Boston, Mass. Japanese Millet..... Perry Seed Co., Boston	(L. 98.00 (F. 98.14	* .85	— .15	— .86	89 90	3/33 6/33
A-61	ROSS BROS. CO., Worcester, Mass. Japanese Millet..... Ross Bros. Co., Worcester	(L. 98.00 (F. 97.85	1.80 2.09	— .06	— .00	95 98	1/33 5/33
A-134	STANFORD SEED CO., Buffalo, N. Y. Japanese Millet, Lot No. 6099..... Nellie I. Griffin, Rutland	(L. 98.66 (F. 99.07	1.30 .75	— .04	— .13	88 87	* 6/33
A-117	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Japanese Millet..... Downey & Howland Hardware Co., Fall River	(L. * (F. 98.40	* 1.15	— .23	— .22	* 78	* 6/33

## OATS

A-80	JOSEPH BRECK & SONS CORP., Boston, Mass. Oats.....	95.00 (L. F.)	99.31	90 92	11/32 6/33
	Joseph Breck & Sons Corp., Boston		.02		
A-25	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Oats.....	98.50 (L. F.)	99.42	92 94	3/33 6/33
	Eastern States Farmers' Ex., Shelburne Falls		Trace .00		
A-71	ROSS BROS. CO., Worcester, Mass. Large White Tartar Oats.....	99.00 (L. F.)	99.81	97 93	2/33 6/33
	Ross Bros. Co., Worcester		.01		

## ORCHARD GRASS

A-119	COMSTOCK, FERRE & CO., Wethersfield, Conn. Orchard Grass (2).....	87.99 (L. F.)	87.99	57	7/33
	J. O. Neill, Fall River		.81		

## FIELD PEAS

A-51	BARBER-BENNETT, INC., Albany, N. Y. Canada Field Peas.....	99.00 (L. F.)	98.42	95 90	4/32 6/33
	Berkshire Coal & Grain Co., North Adams		1.06		
A-81	JOSEPH BRECK & SONS CORP., Boston, Mass. Canada Field Peas.....	98.00 (L. F.)	99.15	90 87	1/33 7/33
	Joseph Breck & Sons Corp., Boston		.00		
A-30	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Field Peas (2).....	99.40 (L. F.)	99.65	85 84	12/31 6/33
	Greenfield Farmers' Coop. Ex., Greenfield		Trace .00		
A-70	ROSS BROS. CO., Worcester, Mass. Canada Field Peas.....	99.00 (L. F.)	99.31	90 82	1/33 6/33
	Ross Bros. Co., Worcester		.00		

## RAPE

A-103	JOSEPH BRECK & SONS CORP., Boston, Mass. Rape.....	99.60 (L. F.)	99.60	74	6/33
	E. E. Bickford & Co., Hingham		.00		
A-84	Dwarf Essex Rape.....	97.00 (L. F.)	99.81	94	10/32
	Joseph Breck & Sons Corp., Boston		.00	80	6/33

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>RAPE—Continued</b>							
A-69	ROSS BROS. CO., Worcester, Mass. Dwarf Essex Rape. Ross Bros. Co., Worcester	(L. 99.60 (F. 99.92)	.20 .00	— .06	— .02	90 89	3/33 6/33
<b>RED TOP</b>							
A-140	W. E. BARRETT CO., Providence, R. I. Red Top. Falmouth Plumbing & Hardware Co., Falmouth	(L. 91.60 (F. 92.77)	* .78	— 6.22	— .23	91 93	2/33 6/33
A-104	JOSEPH BRECK & SONS CORP., Boston, Mass. Choice Red Top (2). E. E. Bickford Co., Hingham	(L. 92.00 (F. 98.15)	* .14	— 1.57	— .14	92 93	11/29 6/33
A-96	Red Top. Morrison-McGowan Co., Cambridge	(L. 90.00 (F. 92.92)	* 1.64	— 5.30	— .14	90 89	2/33 7/33
A-10	ALBERT DICKINSON CO., Chicago, Ill. Red Top, Lot No. 3029 H. C. Puffer Co., Springfield	(L. 92.60 (F. 92.14)	1.80 1.27	— 6.42	— .17	90 91	8/32 7/33
A-48	DOUGHTEN SEED CO., Syracuse, N. Y. Fancy Red Top, Lot No. R-2681. North Adams Flour & Grain Co., North Adams	(L. 91.10 (F. 90.91)	2.50 1.83	6.30 6.99	.10 .27	90 88	4/32 6/33
A-41	DURYEA SEED CO., INC., New York, N. Y. Fancy Red Top, Lot No. 4592. Frank Howard, Inc., Pittsfield	(L. 98.00 (F. 99.14)	.10 .12	— .74	— Trace	95 94	1/33 6/33
A-137	THOMAS W. EMERSON CO., Boston, Mass. Red Top. H. T. Crocker, Brewster	(L. 93.80 (F. 89.16)	.60 .22	— 10.45	— .17	90 93	*/33 6/33
A-108	Red Top. Davison Hardware Co., Medway	(L. * (F. 92.72)	* .52	— 6.67	— .09	* 84	* 6/33
A-123	Red Top. Marlbridge Grain Co., North Andover	(L. 90.40 (F. 92.24)	.70 1.56	— 5.39	— .81	90 92	1/32 7/33
A-111	Red Top (2). Williamson Bros., Somerset	(L. 90.70 (F. 92.77)	1.50 .35	— 6.59	— .29	90 81	8/31 6/33



## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Seed Test
<b>ROUGH STALKED MEADOW GRASS—Continued</b>							
A-68	ROSS BROS. CO., Worcester, Mass. Rough Stalked Meadow Grass. Ross Bros. Co., Worcester	(L. 90.00 (F. 90.46	.50 .37	— 9.17	— .00	90 82	10/32 6/33
A-141	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Rough Stalked Meadow Grass. H. V. Lawrence, Falmouth	(L. 93.01 (F. 91.48	.49 .45	— 8.02	— .05	91 80	2/33 7/33
<b>RYE</b>							
A-106	JOSEPH BRECK & SONS CORP., Boston, Mass. Winter Rye. E. E. Bickford Co., Hingham	(L. * (F. 97.51	* .02	— 1.63	— .84	* 80	* 6/33
A-31	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Rosen Winter Rye. Greenfield Farmers' Cooperative Ex., Greenfield	(L. 99.00 (F. 99.87	Trace .05	.85 .08	.15 .00	90 94	12/32 6/33
<b>RYEGRASS</b>							
A-43	DURVEA SEED CO., INC., New York, N. Y. Domestic Ryegrass, Lot No. 4592 Frank Howard, Inc., Pittsfield	(L. 99.00 (F. 99.22	.69 .54	— .20	— .04	93 94	1/33 6/33
A-67	ROSS BROS. CO., Worcester, Mass. Domestic Ryegrass. Ross Bros. Co., Worcester	(L. 99.00 (F. 98.67	.50 1.24	— .09	— .00	97 94	2/33 6/33
A-92	THOMAS W. EMERSON CO., Boston, Mass. Italian Ryegrass. Thomas W. Emerson Co., Boston	(L. 99.63 (F. 96.48	.128 1.60	— 1.73	— .19	96.05 93	1/33 6/33
<b>SUNFLOWER</b>							
A-44	PAGE SEED CO., Greene, N. Y. Sunflower. Berkshire Hardware Co., Pittsfield	(L. * (F. 99.61	* .00	— .39	— .00	* 86	* 6/33

## TIMOTHY

A-77	JOSEPH BRECK & SONS CORP., Boston, Mass. Timothy Joseph Breck & Sons Corp., Boston	(L. (F.	98.00 98.92	* .15	— .64	— .29	90 91	10/32 7/33
A-105	Choice Timothy (2) E. E. Bickford Co., Hingham	(L. (F.	99.00 99.61	* .10	— .24	— .05	92 89	11/29 6/33
A-98	COLLINS SEED SERVICE, INC., Boston, Mass. Timothy Collins Seed Service, Inc., Boston	(L. (F.	99.60 99.85	.05 .05	— .10	— .00	90 88	1/33 5/33
A-47	ALBERT DICKINSON CO., Chicago, Ill. Timothy W. N. Potter Grain Stores, Inc., Williamstown	(L. (F.	99.65 99.70	.05 .10	— .15	— .05	94 96	10/32 7/33
A-18	Timothy, Lot No. 68430 Prentiss Brooks & Co., Holyoke	(L. (F.	99.70 99.76	.05 .10	— .09	— .05	94 91	9/32 5/33
A-9	Timothy, Lot No. 68519 H. C. Puffer Co., Springfield	(L. (F.	99.65 99.85	.05 .00	— .15	— .00	94 92	10/32 5/33
A-13	Timothy, Lot No. 68161 D. F. Riley, North Hatfield	(L. (F.	99.70 99.76	.05 .05	— .14	— .05	94 92	5/32 5/33
A-23	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Timothy Eastern States Farmers' Ex., Greenfield	(L. (F.	99.65 99.71	.05 .05	.20 .14	.10 .10	91 91	12/32 7/33
A-138	THOMAS W. EMERSON CO., Boston, Mass. Timothy H. T. Crocker, Brewster	(L. (F.	98.50 98.57	.20 .99	— .15	— .29	92 93	3/33 6/33
A-107	Bay State Timothy Davison Hardware Co., Medway	(L. (F.	* 99.68	* .00	— .23	— .09	* 93	* 6/33
A-126	Timothy F. X. Robichaud, Methuen	(L. (F.	99.70 99.71	.05 .05	— .19	— .05	95 94	* 6/33
A-113	Gem Timothy Williamson Bros., Somerset	(L. (F.	98.50 99.03	.35 .15	— .53	— .29	92 90	11/32 6/33
A-5	STANFORD SEED CO., Buffalo, N. Y. Timothy, Lot No. 5634 E. J. Adams & Son, Gt. Barrington	(L. (F.	99.60 99.63	.05 .05	— .23	— .09	92 85	3/32 5/33

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>TIMOTHY—Continued</b>							
A-146	N. WERTHEIMER & SONS, Buffalo, N. Y. Timothy Buzzards Bay Grain Co., Buzzards Bay	99.80 (L. F.) 99.62	.02 .05	.10 .24	.08 .09	* 90	* 6/33
A-74	Matrix Timothy The Cutler Company, West Brookfield	99.50 (L. F.) 99.57	.02 .09	.28 .24	.20 .10	93 89	3/33 6/33
A-34	Timothy, Lot No. 32527 W. N. Potter Grain Stores, Inc., Greenfield	99.65 (L. F.) 99.52	.10 .24	.10 .24	.15 .00	92 92	2/33 5/33
A-2	Matrix Timothy, Lot No. 31523 Stevens Grain Co., Gt. Barrington	99.86 (L. F.) 99.77	.02 .09	.10 .09	.02 .05	94 88	2/32 5/33
A-46	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Timothy L. P. Adams, Dalton	99.60 (L. F.) 99.80	.05 .05	— .15	— .00	90 92	4/33 5/33
A-73	Frontier Timothy Bond Grain Co., Charlton Depot	98.01 (L. F.) 98.74	.23 .10	— .92	— .24	90 88	2/32 6/33
A-55	Pan-American Timothy Davis Hardware Co., Gardner	99.60 (L. F.) 99.71	.05 .05	— .19	— .05	90 93	1/33 5/33
A-118	Pan-American Timothy Downey & Howland Hardware, Fall River	99.60 (L. F.) 99.80	.05 .05	— .15	— .00	90 95	2/33 6/33
A-130	Timothy (2) Staples Hardware Co., Haverhill	98.00 (L. F.) 99.65	* .05	— .25	— .05	90 93	* 6/33
<b>VETCH</b>							
A-21	K. & A. SEED CO., Harrisburg, Pa. Winter Vetch Sunshine Feed Stores, Greenfield	99.50 (L. F.) 99.90	.05 .00	— .10	— Trace	88 89-8	2/33 7/33
<b>WOOD MEADOW GRASS</b>							
A-83	JOSEPH BRECK & SONS CORP., Boston, Mass. Wood Meadow Grass Joseph Breck & Sons Corp., Boston	79.00 (L. F.) 74.61	* 2.20	— 19.35	— 3.34	75 67	1/33 6/33

A-144 WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.  
 Wood Meadow Grass..... (L. 85.78 75 2/33  
 H. V. Lawrence, Falmouth (F. 87.51 60 6/33

## MIXTURES

K. & A. SEED CO., Harrisburg, Pa.

A-29 C. A. Millet (Japanese), Lot B-1..... (L. 96.13 85 3/33  
 State College, Farm Department, Amherst (F. 94.27 5/33  
 Japanese Millet..... (F. 84.28  
 Hungarian Millet..... (F. 9.99 68

PEDIGREED SEED CO., New York, N. Y.

A-101 Prime White Clover..... (L. \* 85 \*  
 Kingston Hardware Co., Kingston (F. 91.74 6/33  
 White Clover..... (F. 72.56  
 Timothy..... (F. 19.18 39-58  
 59

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES</b>					
C-26	JOSEPH BRECK & SONS CORP., Boston, Mass.				
	Setab Lawn Seed.....(L.	92.00	79	6.48	—
	(Ingredients Not Named)*				
	E. E. Bickford Co., Hingham.....(P.	93.89	1.25	4.77	.09
	Red Top.....61.32				
C-29	Timothy.....23.53				
	Kentucky Bluegrass.....5.56				
	White Clover.....3.48				
	Breck's Good Grade Grass Mixture.....(L.	91.71	.44	6.96	.89
	(Ingredients Not Named)*				
C-37	Winer's Hardware Co., Randolph.....(P.	93.99	.61	3.53	1.87
	Domestic Ryegrass.....50.75				
	Timothy.....33.69				
	White Clover.....6.71				
	Red Top.....2.84				
C-38	Breck's Special Lawn Seed Mixture, Setab Brand.....(L.	92.00	.79	6.48	—
	Clean Red Top, Timothy, White Clover, Kentucky Bluegrass				
	E. H. Dyer & Co. Provincetown.....(P.	92.19	1.47	6.25	.09
	Red Top.....71.08				
	Timothy.....11.96				
C-39	White Clover.....5.58				
	Kentucky Bluegrass.....3.57				
	City Park Mixture.....(L.	—	1.50	16.00	2.50
	Red Top, Canada Bluegrass, Domestic Ryegrass, Timothy, White Clover 3%.				
	Hyannis Hardware Co., Hyannis.....(P.	84.09	.99	14.83	.09
C-40	Red Top.....24.88				
	Timothy.....20.50				
	Domestic Ryegrass.....17.22				
	Kentucky Bluegrass (3).....13.13				
	Canada Bluegrass.....5.48				
C-41	White Clover.....2.88				
	DAVIS HARDWARE CO., Gardner, Mass.				
	Grass Seed Mixture, Davis Special.....(L.	93.53	.82	5.60	.05
	(Ingredients Not Named)*				

	Davis Hardware Co., Gardner	(F.)	92.99	.78	6.03	.20
	Timothy	32.88				
	Red Top	29.67				
	Kentucky Bluegrass	22.85				
	White Clover	7.59				
C-4	THE ALBERT DICKINSON CO., Chicago, Ill.	(L.)	-	.60	6.00	-
	Globe Lawn Grass Mixture					
	Red Top, Kentucky Bluegrass, Chewings					
	Fescue, Domestic Ryegrass, Lot No. 3620	(F.)	93.92	.50	5.28	.30
	R. B. Howlett, Amherst					
	Red Top	36.26				
	Kentucky Bluegrass	33.96				
	Chewings Fescue	14.04				
	Domestic Ryegrass	9.66				
C-8	Lawn Seed (acc)	(L.)	-	1.25	15.75	1.00
	6% Kentucky Bluegrass, 19.60% Domestic					
	Ryegrass, 42% Red Top, 9.40% Red Fescue,					
	5% White Clover	(F.)	84.89	1.99	12.92	.20
	Sears, Roebuck & Co., Pittsfield					
	Red Top	44.93				
	Domestic Ryegrass	20.68				
	Red Fescue	8.85				
	White Clover	5.86				
	Kentucky Bluegrass	4.57				
C-9	Fancy Lawn Seed	(L.)	-	1.00	15.10	2.00
	Red Top 26%, Kentucky Bluegrass 22%,					
	Domestic Ryegrass 14.70%, Red Fescue 19.20%	(F.)	78.55	.88	20.08	.49
	Sears, Roebuck & Co., Pittsfield					
	Red Top	28.79				
	Kentucky Bluegrass	19.79				
	Red Fescue	17.04				
	Domestic Ryegrass	12.93				
C-22	Green Clover Grass Mixture	(L.)	-	2.00	18.00	-
	19% Red Top, 32% Domestic					
	Ryegrass, 29% Timothy	(F.)	83.39	1.56	13.59	1.46
	Sears, Roebuck & Co., Boston					
	Timothy	30.70				
	Domestic Ryegrass	28.45				
	Red Top	24.24				

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Boilface type indicates excessive weed seed or excessive inert matter, depending upon the column in which it is found.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES—Continued</b>					
C-1	DOUGHTEN SEED CO., Jersey City, N. J. Lawn Grass Mixture, Faith Shady (Ingredients Not Named)* Community Feed Stores, Inc., South Deerfield. Rough Stalked Meadow Grass..... Domestic Ryegrass..... Red Top..... Timothy..... New Zealand Fescue.....	85.00 (L. (F. 26.53 18.95 18.85 15.45 8.46	.90 .68	13.00 11.08	1.10 .00
C-2	Lawn Grass Seed, Faith. (Ingredients Not Named)* Community Feed Stores, Inc., South Deerfield. Red Top..... Timothy..... Kentucky Bluegrass..... Domestic Ryegrass..... Canada Bluegrass..... Red Fescue..... White Clover.....	79.50 (L. (F. 20.24 16.91 14.23 13.58 7.76 7.49 7.12	1.00 .65	18.25 11.74	1.25 .28
C-5	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Hayland Mixture, No. 2..... Red Top, Timothy, Medium Red Clover, Alsike Clover Eastern States Farmers' Ex., Shelburne Falls Timothy..... Red Top..... Red Clover..... Alsike Clover.....	98.60 (L. (F. 41.78 20.87 20.59 15.32	.22 .19	1.03 1.16	.15 .09
C-14	THOMAS W. EMERSON CO., Boston, Mass. Mixed Lawn Grass Seed..... (Ingredients Not Named)* Elwood Adams, Inc., Worcester. Agrostis spp. (Red Top and Colonial Bent). Kentucky Bluegrass..... Chewings Fescue..... Domestic Ryegrass.....	- (L. (F. 57.24 24.83 9.46 3.06	1.00 .79	8.00 4.53	- .09

C-17	Emerson's Boston Lawn Seed.....	(L.	—	.80	20.60	—
	(Ingredients Not Named)*					
	Kerley, Reed & Bryant, Harvard.....	(F.	93.87	.83	3.92	1.38
	Agrostis spp. (Red Top, Colonial and Velvet Bent)					
	Timothy.....		26.34			
C-21	Domestic Ryegrass.....		27.09			
	Kentucky Bluegrass.....		19.88			
	Red Fescue.....		11.46			
	White Clover.....		6.36			
	White Clover.....		2.74			
C-24	Emerson's Special Mixed Lawn Seed.....	(L.	90.40	.50	4.30	4.80
	(Ingredients Not Named)*					
	Thomas W. Emerson Co., Boston.....	(F.	96.77	.55	2.59	.09
	Agrostis spp. (Red Top and Colonial Bent)					
	Kentucky Bluegrass.....		74.64			
C-24	Chewings Fescue.....		9.65			
	White Clover.....		7.61			
	White Clover.....		4.87			
	Emerson's Special Lawn Seed.....	(L.	—	.50	4.30	—
	Red Top, Kentucky Bluegrass, Chewings					
C-35	Fescue (Red), White Clover, German Bent (4)					
	T. J. Crossman Co., Inc., Needham.....	(F.	94.91	.94	3.56	.59
	Agrostis spp. (Red Top and Colonial Bent)					
	Kentucky Bluegrass.....		66.60			
	White Clover.....		11.88			
C-35	Chewings Fescue.....		8.31			
	Chewings Fescue.....		8.12			
	Special Mixed Lawn Seed.....	(L.	—	.50	4.30	—
	Red Top, Kentucky Bluegrass, Chewings					
	Fescue (Red), White Clover, German Bent (4)					
C-36	Staples Hardware Co., Haverhill.....	(F.	96.44	.57	2.94	.05
	Agrostis spp. (Red Top and Colonial Bent)					
	Kentucky Bluegrass.....		73.97			
	Chewings Fescue.....		9.20			
	White Clover.....		7.68			
C-36	White Clover.....		5.59			
	Lawn Grass Mixture.....	(L.	—	.50	4.30	—
	Red Top, Kentucky Bluegrass, Chewings					
	Red Fescue, White Clover, German Bent (4)					
	E. H. Dyer & Co., Provincetown.....	(F.	96.35	.54	3.06	.05
C-36	Agrostis spp. (Red Top, Colonial and Creeping Bent)					
	Kentucky Bluegrass.....		67.86			
	Chewings Fescue.....		10.89			
	Chewings Fescue.....		9.12			
	White Clover.....		8.48			

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued					
C-13	FITCHBURG HARDWARE CO., Fitchburg, Mass.				
	English Lawn Seed Mixture.	—	.87	13.72	—
	(Ingredients Not Named)*	(L.			
	Fitchburg Hardware Co., Fitchburg.	(F.	.66	10.13	.57
	Timothy.....	39.58			
C-3	HOLBROOK GROCERY CO., Keene, N. H.				
	White Mountain Lawn Grass Seed.....	(L.	*	*	—
	(Ingredients Not Named)*	(F.	1.38	9.87	.10
	Mason A. Dickinson, Amherst.				
	Red Top.....	40.08			
C-20	HOVEY & CO., Boston, Mass.				
	Hovey's Special Mixture.....	(L.	.45	5.25	—
	30% Chewings N. Z. Fescue, 25% Kentucky Bluegrass, 40% Fancy Red Top, 5% Mixed Bent				
	Hovey & Co., Boston.	(F.	.40	5.86	.05
	Festuca sp. (5)	38.68			
C-18	D. LANDRETH SEED CO., Bristol, Pa.				
	Fairmont Park Lawn Grass Mixture.....	(L.	.82	7.41	—
	Fancy Red Top, Kentucky Bluegrass, Chewings Fescue, Perennial Ryegrass, Colonial Bent, White Dutch Clover				
	P. A. Richards Hardware Co., Spencer.	(F.	.70	9.00	1.90
	Agrostis spp. (Red Top and Colonial Bent)	33.70			
	Kentucky Bluegrass.....	40.70			
	Chewings Fescue.....	5.70			
	Perennial Ryegrass.....	5.60			
	White Clover.....	2.70			

C-31	J. O. NEILL, Fall River, Mass.				
	Fancy Lawn Seed.....	(L.	-	*	-
	(Ingredients Not Named)*				
	J. O. Neill, Fall River.....	(F.	90.71	.48	6.78 2.03
C-25	Red Top.....				
	Kentucky Bluegrass.....				
	PEDIGREED SEED CO., New York, N. Y.				
	Bowling Green Lawn Seed.....	(L.	-	*	-
C-30	Red Top, Bluegrass*, Fescue*,				
	Timothy, White Clover (6)				
	Kingston Hardware Co., Kingston.....	(F.	78.47	.50	18.75 2.28
	Timothy.....				
C-33	Red Top.....				
	New Zealand Fescue.....				
	Bowling Green Lawn Seed.....	(L.	-	1.00	11.00 -
	(Ingredients Not Named)*				
C-33	Williamson Bros., Somerset (2).....	(F.	85.91	1.25	12.75 .09
	Timothy.....				
	Red Top.....				
	Red Fescue.....				
C-33	Kentucky Bluegrass.....				
	White Clover.....				
	Hyde Park Lawn Grass Seed.....	(L.	98.00	01	10.00 -
	Bluegrass*, Fancy Red Top, Ryegrass*,				
C-19	Fescue*, Timothy, 5% White Clover				
	Casey's Big General Store, Milford				
	Red Top.....	(F.	78.83	1.48	19.59 .10
	Timothy.....				
C-19	Domestic Ryegrass.....				
	Kentucky Bluegrass.....				
	Pestuca spp. (Red).....				
	White Clover.....				
C-19	PERRY SEED CO., Boston, Mass.				
	Perry's Franklin Park Mixture.....	(L.	91.00	.80	7.00 -
	(Ingredients Not Named)*				
	Perry Seed Co., Boston.....	(F.	90.59	.39	8.82 .20
C-19	Red Top.....				
	Kentucky Bluegrass.....				
	White Clover.....				

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## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Wholesale Distributor, Brand or Trade Name of Mixture,  
Dealer, Place Collected, Name and Percentage  
of Ingredients in each Mixture

Lab. No.		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES—Continued</b>					
C-10	JEROME B. RICE SEED CO., Cambridge, N. Y.				
	Best Mixture Lawn Seed.....	(L.	.83	14.82	-
	Red Top 27.25% Domestic Ryegrass 12.70%, Red Fescue 10.15%, Kentucky Bluegrass 30.75%, White Clover 3.50%.				
	R. A. Stacy & Sons, Williamstown.....	(F.	.59	14.54	2.46
	Kentucky Bluegrass.....				
	Red Top.....				
	Domestic Ryegrass.....				
	Red Fescue.....				
	White Clover.....				
C-15	ROSS BROS. CO., Worcester, Mass.				
	Park Lawn Seed.....	(L.	.80	18.06	-
	Red Top, Kentucky Bluegrass, Domestic Ryegrass, Timothy C. Winter Co., Southbridge.....	(F.	.39	14.19	.09
	Geo. Red Top.....				
	Domestic Ryegrass.....				
	Kentucky Bluegrass.....				
	Timothy.....				
C-11	STANFORD SEED CO., Buffalo, N. Y.				
	Lawn Seed, Lot No. 5001.....	(L.	.01	18.00	-
	(Ingredients Not Named)*	(F.	1.40	12.47	.30
	W. N. Potter Grain Co., Williamstown.....				
	Red Top.....				
	Timothy.....				
	Kentucky Bluegrass.....				
	Domestic Ryegrass.....				
	White Clover.....	(L.	1.00	17.00	-
		(F.	1.39	17.67	.28
C-16	Liberty Lawn Seed.....				
	(Ingredients Not Named)*				
	Waite Hardware Co., Southbridge.....				
	Timothy.....				
	Domestic Ryegrass.....				
	Red Top.....				
	White Clover.....				
	Kentucky Bluegrass.....				
	Canada Bluegrass.....				

C-23	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.				
	Special Mixture (Duncan's)	(L.	85.00	1.00	12.00
	Fancy Red Top 35%, Kentucky Bluegrass 35%				-
	Timothy 10%, English Ryegrass 12% (4),				
	White Clover 8%				
C-27	Henry Duncan Corp., Everett.	(F.	89.30	.89	9.46
	Red Top.				
	Kentucky Bluegrass		32.78		
	Domestic Ryegrass		29.47		
	Timothy.		8.82		
	White Clover.		10.25		
			7.98		
	Boston Special Lawn Seed.	(L.	84.00	Less than	
	(Ingredients Not Named)*			1.00	12.50
	Geo. E. Warren, Brantree.	(F.	91.95	1.05	6.84
C-28	Agrostis spp. (Red Top and Colonial Bent)				.16
	Timothy.		62.18		
	Kentucky Bluegrass		15.59		
	White Clover.		7.44		
			6.74		
	Special Shady Lawn Seed.	(L.	-	*	*
	(Ingredients Not Named)*				
	Geo. Warren, Brantree.	(F.	83.01	1.38	15.61
	Timothy.				
	Domestic Ryegrass.		21.84		
	Red Top.		17.88		
	Canada Bluegrass.		15.22		
	Kentucky Bluegrass		9.39		
	Meadow Fescue.		4.94		
	Crested Dogtail		4.74		
	Rough Stalked Meadow Grass		4.55		
			4.45		
C-32	Excelsior Lawn Grass Seed.	(L.	-	1.00	12.00
	(Ingredients Not Named)*				2.00
	G. W. Gardner & Sons, Fall River.	(F.	89.10	.96	8.49
	Red Top.				
	Kentucky Bluegrass		46.15		
	Chewings Fescue		31.56		
	White Clover		5.79		
C-34	Lawn Seed.	(L.	-	1.00	10.00
	Red Top, Kentucky Bluegrass,				2.00
	White Clover, Chewings Fescue				

Note:—The letters "L" and "P" indicate "Labeled" by the distributor and "Found" by the laboratory.

The \* shows the violation in labeling. (4) Labeled, but not found.

Boldface type indicates excessive weed seed or excessive inert matter, depending upon the column in which it is found.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
<b>SPECIAL SEED MIXTURES—Continued</b>					
C-34	WHITNEY BECKSTEIN SEED CO., Buffalo, N. Y.—Continued				
	John Shea, North Andover.....	89.42	.97	8.60	1.01
	Red Top.....	(F.)			
	Kentucky Bluegrass.....	47.88			
	Chewings Fescue.....	27.64			
C-7	White Clover.....	7.19			
	.....	6.71			
	F. H. WOODRUFF & SONS, Milford, Conn.				
	Lawn Grass Seed Mixture.....	(L.)	1.20	28.60	—
	(Ingredients Not Named)*				
C-6	F. J. Webster Co., Turners Falls.....	81.95	1.20	16.60	.25
	Red Top.....	(F.)			
	Timothy.....	27.75			
	Domestic Ryegrass.....	20.75			
	Kentucky Bluegrass.....	19.25			
C-6	White Clover.....	7.90			
	.....	6.30			
	S. D. WOODRUFF & SONS, Orange, Conn.				
	Special Mixture.....	(L.)	3.00	25.00	—
	Domestic Ryegrass, Timothy				
C-6	Red Top, Poa trivialis 1% Morrissey Bros. Co., Indian Orchard				
	Timothy.....	(F.)	79.95	18.90	.40
	Domestic Ryegrass.....	27.30			
	Red Top.....	25.10			
	Rough Stalked Meadow Grass, Orchard Grass (3).....	10.45			
	.....	9.20			
	.....	7.90			

Note:—The letters "L" and "F" indicate "Labeled" by the distributor and "Found" by the laboratory.

The \* shows the violation in labeling. (3) Ingredient found in excess of 5%, but not declared.

Boldface type indicates excessive weed seed or excessive inert matter, depending upon the column in which it is found.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>BEANS</b>			
D-289	W. E. BARRETT CO., Providence, R. I. Golden Wax Beans..... Buzzards Bay Hardware Co., Buzzards Bay	96	July
D-184	JOSEPH BRECK & SONS CORP., Boston, Mass. Fordhook Bush Lima Beans..... Kingston Hardware Co., Kingston	58 (R)	Aug.
D-172	Kentucky Wonder Beans..... Roslindale Hardware Co., Roslindale	92	July
D-175	Kentucky Wonder Wax Pole Beans..... Kearney's Hardware Store, Hyde Park	95	July
D-130	Sure Crop Stringless Wax Beans..... Joseph Breck & Sons Corp., Boston	92	July
D-144	W. ATLEE BURPEE CO., Philadelphia, Pa. Stringless Green Pod Bush Beans..... Russell R. Cameron, Cambridge	92	July
D-236	COMSTOCK, FERRE & CO., Wethersfield, Conn. Lowe's Champion Beans..... J. O. Neill, Fall River	80 (R)	Aug.
D-263	THOMAS W. EMERSON CO., Boston, Mass. Bountiful Bush Beans..... Lawrence Products Co., Lawrence	90 (R)	Aug.
D-98	Dwarf Horticultural Beans..... G. C. Winter Co., Southbridge	93	July
D-99	Golden Wax Beans..... Geo. C. Winter Co., Southbridge	93	July
D-225	Kentucky Wonder Pole Beans..... Johnson Hardware & Paint Store, Wrentham	91	July
D-231	Sure Crop Black Wax Beans..... Williamson Bros., Somerset	88 (R)	July
D-9	D. M. FERRY SEED CO., Detroit, Mich. (Ferry-Morse Seed Co.) Ford Hook Bush Lima Beans..... Carlisle Hardware Co., Springfield	74 (R)	Aug.
D-168	Golden Wax Beans..... Henry Duncan Corp., Everett	70 (R)	July
D-285	Golden Wax Beans..... Osterville Hardware Co., Osterville	78 (R)	July
D-148	Stringless Green Pod Beans..... Harvard Square Hardware Co., Cambridge	76 (R)	July
D-16	CHAS. C. HART SEED CO., Wethersfield, Conn. Black Wax Beans..... Osborne Hardware Co., Holyoke	95 (R)	Aug.
D-232	Davis White Wax Beans..... Downey & Howeland Hardware Co., Fall River	82 (R)	July
D-76	Pencil Pod Black Wax Beans..... Davis Hardware Co., Gardner	92	May
D-109	D. LANDRETH SEED CO., Bristol, Pa. Kentucky Wonder Green Pod Pole Beans..... P. A. Richards Hardware Co., Spencer	92 (R)	Aug.
D-95	Yellow Eye Beans..... Elwood Adams, Inc., Worcester	90	July
D-211	LEONARD SEED CO., Chicago, Ill. Yellow Six Weeks Beans..... Geo. E. Warren, Braintree	92 (R)	Aug.
D-56	NORTHROP, KING & CO., Minneapolis, Minn. Improved Golden Wax Beans..... F. W. Woolworth & Co., Adams	84 (R)	May

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>BEANS—Continued</b>			
D-281	NORTHRUP, KING & CO. — Continued Kentucky Wonder Beans. . . . . Ryder, Inc., Hyannis	95	July
D-124	PERRY SEED CO. Boston, Mass. Kentucky Wonder Pole Beans, Lot No. 941. . . . . Perry Seed Co., Boston	90	July
D-123	Pencil Pod Black Wax Beans, Lot No. 193. . . . . Perry Seed Co., Boston	90	July
D-75	JEROME B. RICE SEED CO., Cambridge, N. Y. Burpee's Stringless Green Pod Beans. . . . . Danaher Hardware Co., Williamstown	91	May
D-217	Giant Stringless Green Pod Beans. . . . . Morgan Hardware, Randolph	90	Aug.
D-301	ROSS BROS. CO., Worcester, Mass. Dwarf Horticultural Beans. . . . . P. H. Martindale, West Upton	90 (R)	Aug.
D-318	Kentucky Wonder Wax Beans. . . . . S. I. Simenson & Co., Barre	70 (R)	July
D-268	F. H. WOODRUFF & SONS, Milford, Conn. Burpee's Stringless Green Pod Beans. . . . . D. J. Mahoney, Haverhill	90	July
D-30	Improved Golden Wax Beans. . . . . Greenfield Farmers' Cooperative Exchange, Greenfield	91 (R)	Aug.
D-44	Improved Kidney Wax Beans. . . . . Berkshire Hardware Co., Pittsfield	81 (R)	Aug.
D-4	Pencil Pod Black Wax Beans. . . . . Frank Pouchot, Springfield	84	May
D-269	Red Kidney Beans. . . . . D. J. Mahoney, Haverhill	95	July
D-107	S. D. WOODRUFF & SONS, Orange, Conn. Green Stringless Beans. . . . . W. E. Aubuchon Co., Clinton	90 (R)	Aug.
D-11	Pencil Pod Black Wax Beans, Lot No. 5DW3365a. . . . . Prentiss-Brooks & Co., Holyoke	93	May
<b>BEETS</b>			
D-226	THOMAS W. EMERSON CO., Boston, Mass. Blood Turnip Beet. . . . . Johnson Hardware & Paint Co., Wrentham	86	July
D-279	Detroit Dark Red Beet. . . . . Eastman's Hardware Co., Falmouth	86	July
D-100	Dewings Blood Beet. . . . . Geo. C. Winter Co., Southbridge	82	July
D-206	Eclipse Blood Beet. . . . . Davison Hardware Co., Medway	80	July
D-202	FERRY-MORSE SEED CO., Detroit, Mich. Cardinal Beet. . . . . S. C. M. Packard & Co., Wareham	79	July
D-178	Crosby's Egyptian Beet. . . . . Robert Winslow Nurseries, Needham	82	July
D-156	Detroit Dark Red Beet. . . . . Revere Hardware Co., Revere	83	July
D-195	CHAS. C. HART SEED CO., Wethersfield, Conn. Crosby's Egyptian Beet. . . . . The Church & Stowell Co., Wareham	88	July
D-277	Crosby's Egyptian Beet. . . . . D. M. Seabury & Sons, Barnstable	95	July

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>BEETS—Continued</b>			
D-13	CHAS. C. HART SEED CO. — Continued Detroit Dark Red..... J. Russell Co., Inc., Holyoke	83 (R)	Aug.
D-90	BUDD D. HAWKINS, Reading, Vt. Detroit Dark Red Beets..... Elwood Adams, Inc., Worcester	78	July
D-181	LAKE SHORE SEED CO., Dunkirk, N. Y. Early Egyptian Blood Beet..... T. J. Crossman, Inc., Needham	74	July
D-253	LEONARD SEED CO., Chicago, Ill. Crosby's Egyptian Beet..... A. I. Trask Hardware Co., Brockton	90	July
D-53	NORTHROP, KING & CO., Minneapolis, Minn. Early Blood Turnip Beet..... A. E. Sherman, Lanesboro	84	July
D-25	Early Wonder Beet..... F. W. Woolworth Co., Greenfield	80	June
D-39	PAGE SEED CO., Greene, N. Y. Crosby's Egyptian Beet..... The Clifford Co., Lenox	76	June
D-88	JEROME B. RICE SEED CO., Cambridge, N. Y. Crosby's Egyptian Beet..... H. F. Sawtelle, Leominster	82	July
D-150	Detroit Dark Red Beet..... Central Square Hardware Co., Cambridge	70 (R)	July
D-74	Early Blood Turnip Beet..... Danaher Hardware Co., Williamstown	86	June
D-300	ROSS BROS. CO., Worcester, Mass. Detroit Dark Red Beet..... P. H. Martindale, West Upton	83	July
D-270	F. H. WOODRUFF & SONS, Milford, Conn. Crosby's Egyptian Beet..... D. J. Mahoney, Haverhill	83	July
D-262	Crosby's Egyptian Beet..... John Shea, North Andover	83	July
D-114	S. D. WOODRUFF & SONS, Orange, Conn. Detroit Dark Red Beet..... W. E. Aubuchon Co., Clinton	71	July
<b>BRUSSELS SPROUTS</b>			
D-159	JOSEPH BRECK & SONS CORP., Boston, Mass. Brussels Sprouts..... Joseph Breck & Sons Corp., Boston	50 (R)	July
<b>CABBAGE</b>			
D-242	COMSTOCK, FERRE & CO., Wethersfield, Conn. Red Cabbage..... J. O. Neill, Fall River (2)	3 (R)	Aug.
D-136	THOMAS W. EMERSON CO., Boston, Mass. Danish Ballhead Cabbage..... Thomas W. Emerson Co., Boston	87	Aug.
D-208	Early Jersey Wakefield Cabbage..... Davison Hardware Co., Medway	62 (R)	July
D-174	FERRY-MORSE SEED CO., Detroit, Mich. Early Jersey Wakefield Cabbage..... Mackay Newcomb Co., Boston	83 (R)	Aug.
D-141	Early Jersey Wakefield Cabbage..... Sears, Roebuck & Co., Boston	96	July
D-203	Early Sugar Cone Cabbage..... S. C. M. Packard & Co., Warcham	86	July

Note:—(R) indicates a retest. (2) Old seed.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>CABBAGE—Continued</b>			
D-81	CHAS. C. HART SEED CO., Wethersfield, Conn. Danish Ball Head Cabbage..... Davis Hardware Co., Gardner	79 (R)	Aug.
D-14	Danish Ball Head Cabbage..... J. Russell Co., Inc., Holyoke	79 (R)	Aug.
D-2	Early Green Curled Savoy Cabbage..... George Methe Co., Westfield	77 (R)	Aug.
D-259	HAWKINS SEED CO., Reading, Vt. Budd's Genuine Surehead Cabbage..... C. H. Ellis, Westwood	85	July
D-26	NORTHRUP KING & CO., Minneapolis, Minn. Early Dwarf Flat Dutch Cabbage..... F. W. Woolworth Co., Greenfield	73 (R)	Aug.
D-104	Early Jersey Wakefield Cabbage..... Waite Hardware Co., Southbridge	67 (R)	Aug.
D-122	PAGE SEED CO., Greene, N. Y. Danish Ball Head Cabbage..... Fullam Hardware Co., North Brookfield	87	July
D-126	PERRY SEED CO., Boston, Mass. Copenhagen Market Cabbage..... Perry Seed Co., Boston	66 (R)	July
D-266	JEROME B. RICE SEED CO., Cambridge, N. Y. Cabbage..... Treat Hardware Co., Lawrence	90	July
D-86	Danish Round Head Cabbage..... H. F. Sawtelle, Leominster	68 (R)	Aug.
D-186	Rice's Premium Late Flat Dutch Cabbage..... G. W. Hunt, South Duxbury	96	July
D-271	F. H. WOODRUFF & SONS, Milford, Conn. Early Jersey Wakefield Cabbage..... D. J. Mahoney, Haverhill	80 (R)	Aug.
<b>CARROTS</b>			
D-220	JOSEPH BRECK & SONS CORP., Boston, Mass. Danvers Half Long Carrot..... Winer's Hardware, Randolph	55 (R)	July
D-209	THOMAS W. EMERSON CO., Boston, Mass. Danvers Half Long Carrot..... Davison Hardware Co., Medway	62 (R)	July
D-137	Danvers Half Long Carrot..... Thomas W. Emerson Co., Boston	69 (R)	Aug.
D-257	Long Orange Carrot..... F. W. Carson Hardware Co., Dedham	49 (R)	July
D-91	FERRY-MORSE SEED CO., Detroit, Mich. Danvers Carrot..... Elwood Adams, Inc., Worcester	59 (R)	July
D-3	Nantes Carrot..... George Methe Co., Westfield	48 (R)	Aug.
D-196	CHAS. C. HART SEED CO., Wethersfield, Conn. Long Orange Carrot..... The Church & Stowell Co., Wareham	77	July
D-276	Long Orange Carrot..... D. M. Seabury & Sons, Barnstable	78	July
D-59	LAKE SHORE SEED CO., Dunkirk, N. Y. Danvers Half Long Carrot..... P. J. Vrabel Hardware Co., Adams	58 (R)	May

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>CARROTS—Continued</b>			
D-54	NORTHRUP, KING & CO., Minneapolis, Minn. Chantenay Carrot, . . . . . A. E. Sherman, Lanesboro	65 (R)	Aug.
D-322	Improved Danvers Half Long Carrot, . . . . . H. E. Bingham, Hardwick	56 (R)	Aug.
D-102	Improved Danvers Half Long Carrot, . . . . . G. C. Winter Co., Southbridge	53 (R)	July
D-60	Improved Danvers Half Long Carrot, . . . . . F. W. Woolworth Co., North Adams	66 (R)	May
D-280	Ox Heart Carrot, . . . . . Ryder, Inc., Hyannis	66 (R)	July
D-121	PAGE SEED CO., Greene, N. Y. Danvers Half Long Carrot, . . . . . Fullam Hardware Co., North Brookfield	55 (R)	Aug.
D-265	JEROME B. RICE SEED CO., Cambridge, N. Y. Carrot, . . . . . Treat Hardware Co., Lawrence	67 (R)	Aug.
D-170	Orange New Carrot, . . . . . Glendale Hardware Co., Everett	65 (R)	Aug.
D-82	F. H. WOODRUFF & SONS, Milford, Conn. Danvers Half Long Carrot, . . . . . Fitchburg Hardware Co., Fitchburg	62 (R)	Aug.
D-128	S. D. WOODRUFF & SONS, Orange, Conn. Improved Long Orange Carrot, . . . . . A. T. Patch Co., Boston	75	July
<b>CAULIFLOWER</b>			
D-256	JOSEPH BRECK & SONS CORP., Boston, Mass. Early Snowball Cauliflower, . . . . . F. W. Carson Hardware Co., Dedham	69 (R)	Aug.
D-173	Early Snowball Cauliflower, . . . . . Davis Hardware Co., Boston	81 (R)	Aug.
D-177	THOMAS W. EMERSON CO., Boston, Mass. Snowball Cauliflower, . . . . . Needham Hardware Co., Needham	80 (R)	Aug.
D-230	FERRY-MORSE SEED CO., Detroit, Mich. Early Snowball Cauliflower, . . . . . Johnson Hardware & Paint Co., Wrentham	84	July
D-41	CHAS. C. HART SEED CO., Wethersfield, Conn. Earliest Snowball Cauliflower, . . . . . Berkshire Hardware Co., Pittsfield	12 (R)	May
D-171	Early Snowball Cauliflower, . . . . . New Style Hardware Stores, Roslindale	73 (R)	Aug.
D-246	LEONARD SEED CO., Chicago, Ill. Early Snowball Cauliflower, . . . . . Sanford Hardware Co., Fall River	54 (R)	Aug.
D-63	NORTHRUP, KING & CO., Minneapolis, Minn. Early Snowball Cauliflower, . . . . . F. W. Woolworth Co., North Adams	62 (R)	Aug.
D-120	PAGE SEED CO., Greene, N. Y. Early Snowball Cauliflower, . . . . . Fullam Hardware Co., North Brookfield	58 (R)	July
<b>CELERY</b>			
D-133	JOSEPH BRECK & SONS CORP., Boston, Mass. Breck's Boston Market Celery, . . . . . Joseph Breck & Sons Corp., Boston	81	July
D-243	COMSTOCK, FERRE & CO., Wethersfield, Conn. Giant Pascal Celery, . . . . . J. O. Neill, Fall River (2)	12 (R)	Aug.

Note:—(R) indicates a retest. (2) Old seed.



## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>CELERY—Continued</b>			
D-106	CHAS. C. HART SEED CO., Wethersfield, Conn. Giant Pascal Celery ..... Waite Hardware Co., Southbridge	42 (R)	Aug.
D-49	Golden Self-Blanching Celery ..... T. A. Frissell, Jr., Hinsdale	35 (R)	Aug.
D-282	NORTHROP, KING & CO., Minneapolis, Minn. Early Golden Self-Blanching Celery ..... Ryder's Inc., Hyannis	51 (R)	Aug.
D-251	F. H. WOODRUFF & SONS, Milford, Conn. Golden Celery ..... A. I. Task Hardware Co., Brockton	66	July
<b>SWEET CORN</b>			
D-288	W. E. BARRETT CO., Providence, R. I. Golden Bantam Sweet Corn ..... Buzzards Bay Hardware Co., Buzzards Bay	84	July
D-64	BERKSHIRE COAL & GRAIN CO., North Adams, Mass. Giant Bantam Sweet Corn ..... Berkshire Coal & Grain Co., North Adams	81	May
D-189	JOSEPH BRECK & SONS CORP., Boston, Mass. Golden Bantam Corn ..... E. E. Bickford Co., Hingham	88	July
D-166	Golden Giant Corn ..... W. E. Coffin, Inc., Melrose	92	July
D-284	Golden Giant Sweet Corn ..... Hyannis Hardware Co., Hyannis	95	July
D-183	Golden Giant Corn ..... Kingston Hardware Co., Kingston	80	July
D-146	Golden Sunshine Sweet Corn ..... Morrison-MacGowan Co., Cambridge	85	July
D-304	THOMAS W. EMERSON CO., Boston, Mass. Early Golden Sunrise Corn ..... Uxbridge Hardware & Furniture Co., Uxbridge	94	July
D-264	Golden Bantam Corn ..... Lawrence Products Co., Lawrence	91	July
D-261	Golden Bantam Corn ..... Marbleridge Grain Co., North Andover	91	July
D-286	FERRY-MORSE SEED CO., Detroit, Mich. Golden Bantam Corn ..... Osterville Hardware Co., Osterville	84 (R)	July
D-77	CHAS. C. HART SEED CO., Wethersfield, Conn. Early Golden Bantam Corn ..... Davis Hardware Co., Gardner	80 (R)	July
D-12	Early Golden Sunshine Corn ..... J. Russell & Co., Inc., Holyoke	91	May
D-155	Golden Sunshine Corn ..... Bellingham Hardware Co., Chelsea	91	July
D-96	D. LANDRETH SEED CO., Bristol, Pa. Golden Giant Corn ..... Elwood Adams, Inc., Worcester	87	July
D-129	LEONARD SEED CO., Chicago, Ill. Golden Bantam Sweet Corn ..... A. G. Patch Co., Boston	92	July
D-66	PAGE SEED CO., Greene, N. Y. Golden Bantam Sweet Corn ..... Ford & Parker Co., Dalton	81	May
D-199	JEROME B. RICE SEED CO., Cambridge, N. Y. Golden Bantam Corn ..... The Church & Stowell Co., Wareham	78 (R)	July

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>SWEET CORN—Continued</b>			
JEROME B. RICE SEED CO., Cambridge, N. Y.—Continued			
D-325	Golden Bantam Sweet Corn..... C. M. Rossier, Paxton	80	July
D-218	Golden Giant Corn..... Morgan Hardware Co., Randolph	86	July
ROSS BROS. CO., Worcester, Mass.			
D-319	Black Mexican Sweet Corn..... S. I. Simenson & Co., Barre	72 (R)	July
D-292	Early Dighton Corn..... Casey's Big General Store, Milford	80	July
D-299	Golden Bantam Sweet Corn..... P. H. Martindale, West Upton	79 (R)	July
F. H. WOODRUFF & SONS, Milford, Conn.			
D-244	Golden Sunshine Sweet Corn..... Sanford Hardware Co., Fall River	88 (R)	July
S. D. WOODRUFF & SONS, Orange, Conn.			
D-68	Golden Bantam Corn..... C. F. Glennon, Dalton	94	May
WHOLESALE NOT NAMED			
D-7	Golden Bantam Sweet Corn..... Carlisle Hardware Co., Springfield	73 (R)	July
<b>CRESS</b>			
COMSTOCK, FERRE & CO., Wethersfield, Conn.			
D-250	Curled Cress..... J. O. Neill, Fall River	72	Aug.
LAKE SHORE SEED CO., Dunkirk, N. Y.			
D-307	Curled Cress, or Peppergrass..... Uxbridge Hardware & Furniture Co., Uxbridge	97	Aug.
<b>CUCUMBER</b>			
THOMAS W. EMERSON CO., Boston, Mass.			
D-207	Improved White Spine Cucumber..... Davison Hardware Co., Medway	97	July
D-190	White Spine Cucumber..... Schultz Hardware Co., Scituate	99	July
D-103	White Spine Cucumber..... Geo. C. Winter Co., Southbridge	97	July
FERRY-MORSE SEED CO., Detroit, Mich.			
D-201	Improved Long Green Cucumber..... S. C. M. Packard & Co., Wareham	63 (R)	Aug.
D-142	Improved Long Green Cucumber..... Pill Hardware & Supply Co., Cambridge	67 (R)	July
D-10	Improved White Spine Cucumber..... Carlisle Hardware Co., Springfield	87	May
CHAS. C. HART SEED CO., Wethersfield, Conn.			
D-312	Boston Pickling Cucumber..... Kelton's Market, Holden	96	July
D-255	Early Cluster Cucumber..... F. W. Carson Hardware Co., Dedham	59 (R)	July
D-152	Improved Long Green Cucumber..... A. K. Mann & Co., Chelsea	98	July
D-111	Improved White Spine Cucumber..... Kerley, Reed & Bryant, Harvard	74 (R)	July
HAWKINS SEED CO., Reading, Vt.			
D-233	Improved Long Green Cucumber..... Downey & Howland Hardware, Fall River	90	July

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>CUCUMBERS—Continued</b>			
D-117	D. LANDRETH SEED CO., Bristol, Pa. Early White Spine Cucumber..... P. A. Richards Hardware Co., Spencer	94	July
D-32	NORTHROP, KING & CO., Minneapolis, Minn. Boston Pickling Cucumber..... E. M. Gulow & Co., Turners Falls	93	May
D-55	Boston Pickling Cucumber..... F. W. Woolworth Co., Adams	90	May
D-36	PAGE SEED CO., Greene, N. Y. Early Cluster Cucumber..... Dresser, Hull Co., Lee	74 (R)	May
D-267	JEROME B. RICE SEED CO., Cambridge, N. Y. Cucumber..... Treat Hardware Corp., Lawrence	86	July
D-1	ROSS BROS. CO., Worcester, Mass. Early White Spine Cucumber..... George Methe Co., Westfield	95	May
D-293	Long Green Leaf Cucumber..... Casey's Big General Store, Milford	98	July
D-252	F. H. WOODRUFF & SONS, Milford, Conn. Boston Pickling Cucumber..... A. I. Task Hardware Co., Brockton	94	July
D-272	White Spine Improved Cucumber..... D. J. Mahoney, Haverhill	98	July
<b>ENDIVE</b>			
D-119	FREDONIA SEED CO., Fredonia, N. Y. Broad Leaved Escarolle Endive..... C. F. Wheeler Estate, West Brookfield	75 (R)	Aug.
D-308	LAKE SHORE SEED CO., Dunkirk, N. Y. Green Curled Endive..... Uxbridge Hardware & Furniture Co., Uxbridge	50 (R)	July
D-37	PAGE SEED CO., Greene, N. Y. Broad Leaf Batavian Endive..... Dresser, Hull Co., Lee	80 (R)	Aug.
<b>KALE</b>			
D-314	FERRY-MORSE SEED CO., Detroit, Mich. Dwarf Curled Scotch Kale..... Nellie I. Griffin, Rutland	73 (R)	July
D-43	CHAS. C. HART SEED CO., Wethersfield, Conn. Dwarf Green Curled Scotch Kale..... Berkshire Hardware Co., Pittsfield	81 (R)	Aug.
<b>KOHL RABI</b>			
D-215	JOSEPH BRECK & SONS CORP., Boston, Mass. White Vienna Kohl Rabi..... Geo. E. Warren, Braintree	60 (R)	Aug.
<b>LETTUCE</b>			
D-131	JOSEPH BRECK & SONS CORP., Boston, Mass. Tennis Ball, Breck's Black Seeded, Lettuce..... Joseph Breck & Sons Corp., Boston	80 (R)	June
D-194	THOMAS W. EMERSON CO., Boston, Mass. Big Boston Lettuce..... Schultz Hardware Co., Scituate	87	June
D-306	Early Curled Simpson Lettuce..... Uxbridge Hardware & Furniture Co., Uxbridge	95	June
D-158	FERRY-MORSE SEED CO., Detroit, Mich. Ferry's Early Prize Lettuce..... Coleman Supply Co., Boston	85 (R)	Aug.

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>LETTUCE—Continued</b>			
<b>FERRY-MORSE SEED CO., — Continued</b>			
D-204	Simpson's Early Curled Lettuce..... S. W. Lucas, Lakeville	86	June
D-46	White Paris Cos Lettuce..... Sears, Roebuck & Co., Pittsfield	85	May
<b>THOMAS J. GREY CO., Boston, Mass.</b>			
D-140	White Boston Lettuce..... Thomas J. Grey Co., Boston	96	June
<b>CHAS. C. HART SEED CO., Wethersfield, Conn.</b>			
D-112	Big Boston Head Lettuce..... Kerley, Reed & Bryant, Harvard	80 (R)	Aug.
D-80	Iceberg Lettuce..... Davis Hardware Co., Gardner	95	June
D-15	Prize Head Lettuce..... Osborne Hardware Co., Holyoke	89	May
<b>HAWKINS SEED CO., Reading, Vt.</b>			
D-258	Early Prize Head Lettuce..... C. H. Ellis, Westwood	87	June
<b>LAKE SHORE SEED CO., Dunkirk, N. Y.</b>			
D-162	Grand Rapids Lettuce..... Eastern Hardware Co., Boston	49 (R)	June
D-57	Hanson Lettuce..... P. J. Vrabel Hardware Co., Adams	55 (R)	Aug.
<b>LEONARD SEED CO., Chicago, Ill.</b>			
D-245	Iceberg Lettuce..... Sanford Hardware Co., Fall River	91	June
<b>PAGE SEED CO., Greene, N. Y.</b>			
D-70	Early Prize Head Lettuce..... R. A. Stacey & Sons, Williamstown	78	May
<b>PERRY SEED CO., Boston, Mass.</b>			
D-127	New York, or Wonderful Lettuce..... Perry Seed Co., Boston	90	June
<b>JEROME B. RICE SEED CO., Cambridge, N. Y.</b>			
D-22	Early Prize Head Lettuce..... F. A. Clark, Conway	92	May
D-185	Early Prize Head Lettuce..... G. W. Hunt, South Duxbury	76 (R)	June
D-310	Improved Hanson Lettuce..... Kelton's Market, Holden	96	June
<b>ROSS BROS. CO., Worcester, Mass.</b>			
D-296	New York D. G. Iceberg Lettuce..... Casey's Big General Store, Milford	96	June
<b>F. H. WOODRUFF &amp; SONS, Milford, Conn.</b>			
D-273	Paris White Cos Lettuce..... D. J. Mahoney, Haverhill	92	June

## MUSKMELON

<b>JOSEPH BRECK &amp; SONS CORP., Boston, Mass.</b>			
D-132	Golden Champlain Muskmelon..... Joseph Breck & Sons Corp., Boston	94	July
D-180	Rocky Ford Muskmelon..... Pioneer Radio & Hardware Store, Needham	68 (R)	July
<b>FERRY-MORSE SEED CO., Detroit, Mich.</b>			
D-205	Rocky Ford Muskmelon..... S. W. Lucas, Lakeville	86	July
<b>NORTHROP, KING &amp; CO., Minneapolis, Minn.</b>			
D-61	Rocky Ford Muskmelon..... F. W. Woolworth Co., North Adams	86 (R)	Aug.

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>MUSKMELON—Continued</b>			
D-89	ROSS BROS. CO., Worcester, Mass. Bender's Surprise Muskmelon..... Ross Bros. Co., Worcester	95	July
D-321	Paul Rose Muskmelon..... S. I. Simenson & Co., Barre	78 (R)	July
D-213	Paul Rose Muskmelon..... Geo. E. Warren, Braintree	79 (R)	July
<b>ONION</b>			
D-290	FERRY-MORSE SEED CO., Detroit, Mich. L. Red Wethersfield Onion..... J. D. Hilliard Co., Provincetown	68 (R)	July
D-327	CHAS. C. HART SEED CO., Wethersfield, Conn. Yellow Globe Danvers Onion..... Grange Store, Amherst	84	June
D-274	F. H. WOODRUFF & SONS, Milford, Conn. Yellow Globe Danvers Onion..... D. J. Mahoney, Haverhill	72	July
<b>PARSLEY</b>			
D-138	THOMAS W. EMERSON CO., Boston, Mass. Double Curled Parsley..... Thomas W. Emerson Co., Boston	80	July
D-93	FERRY-MORSE SEED CO., Detroit, Mich. Champ. Moss Curled Parsley..... Elwood Adams, Inc., Worcester	68 (R)	Aug.
D-45	Hamburg Thick Rooted Parsley..... Sears, Roebuck & Co., Pittsfield	64 (R)	Aug.
D-247	LEONARD SEED CO., Chicago, Ill. Plain Parsley..... Sanford Hardware Co., Fall River	72 (R)	Aug.
D-31	NORTHROP, KING & CO., Minneapolis, Minn. Dark Moss Curled Parsley..... E. M. Gulow & Co., Turners Falls	55 (R)	Aug.
D-200	Dark Moss Curled Parsley..... S. C. M. Packard & Co., Wareham	63 (R)	July
D-113	S. D. WOODRUFF & SONS, Orange, Conn. Dark Moss Curled Parsley..... W. E. Aubuchon Co., Clinton	75	July
<b>PARSNIPS</b>			
D-134	JOSEPH BRECK & SONS CORP., Boston, Mass. Hollow Crown Parsnip..... Joseph Breck & Sons Corp., Boston	66	July
D-210	THOMAS W. EMERSON CO., Boston, Mass. Hollow Crown Parsnip..... Davison Hardware Co., Medway	59 (R)	July
D-228	Hollow Crown Parsnip..... Johnson Hardware & Paint Co., Wrentham	70	July
D-8	D. M. FERRY SEED CO., Detroit, Mich. Hollow Crown Parsnip..... Carlisle Hardware Co., Springfield	68 (R)	Aug.
D-35	PAGE SEED CO., Greene, N. Y. Hollow Crown Parsnip (1932)..... Dresser, Hull Co., Lee	57 (R)	June
D-320	JEROME B. RICE SEED CO., Cambridge, N. Y. Hollow Crown Parsnip..... S. I. Simenson & Co., Barre	77	July
D-92	Long White Dutch Parsnip..... Elwood Adams, Inc., Worcester	75	July

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>PEAS</b>			
D-287	JOSEPH BRECK & SONS CORP., Boston, Mass. Nott's Excelsior Peas..... W. B. Eldridge, Harwichport	71 (R)	July
D-188	The Record Peas..... E. E. Bickford Co., Hingham	85	July
D-182	Telephone Peas..... Kingston Hardware Co., Kingston	82 (R)	July
D-145	Telephone Peas..... Morrison-MacGowan Co., Cambridge	83 (R)	July
D-212	Thomas Laxton Peas..... Geo. E. Warren, Braintree	86	July
D-237	COMSTOCK, FERRE & CO., Wethersfield, Conn. Gradus Peas..... J. O. Neill, Fall River	96	July
D-305	THOMAS W. EMERSON CO., Boston, Mass. Nott's Excelsior Peas..... Uxbridge Hardware & Furniture Co., Uxbridge	81 (R)	Aug.
D-260	Sutton's Excelsior Peas..... Marbleridge Grain Co., North Andover	88	July
D-101	Sutton's Excelsior Peas..... G. C. Winter Co., Southbridge	91	July
D-164	FERRY-MORSE SEED CO., Detroit, Mich. Premium Gem Peas..... Timothy Smith Co., Boston	85	Aug.
D-78	CHAS. C. HART SEED CO., Wethersfield, Conn. Tall Telephone Peas..... Davis Hardware Co., Gardner	89	May
D-50	Tall Telephone Peas..... T. A. Frissell, Jr., Hinsdale	92	May
D-97	D. LANDRETH SEED CO., Bristol, Pa. Dwarf Telephone Peas..... Elwood Adams, Inc., Worcester	79 (R)	July
D-110	Nott's Excelsior Peas..... P. A. Richards Hardware Co., Spencer	92	July
D-65	PAGE SEED CO., Greene, N. Y. Telephone Peas..... Ford & Parker, Dalton	88 (R)	Aug.
D-20	JEROME B. RICE SEED CO., Cambridge, N. Y. Bliss American Wonder Peas..... W. D. Miller, East Northfield	86	May
D-326	Blue Bantam Peas..... C. M. Rossier, Paxton	96	July
D-224	Nott's Excelsior Peas..... Morgan Hardware Co., Randolph	96	July
D-317	ROSS BROS. CO., Worcester, Mass. Telephone Peas..... S. I. Simenson & Co., Barre	85	July
D-298	Thomas Laxton Peas..... C. C. Shattuck, Mendon	82 (R)	Aug
D-5	F. H. WOODRUFF & SONS, Milford, Conn. Laxton Progress Peas..... Frank Pouchot, Springfield	85	May
D-17	S. D. WOODRUFF & SONS, Orange, Conn. Nott's Excelsior Peas..... Morrissey Bros. Co., Indian Orchard	94	May
D-69	Telephone Peas..... C. F. Glennon, Dalton	95	May

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>PEPPER</b>			
D-161	JOSEPH BRECK & SONS CORP., Boston, Mass. Large Bell Pepper..... South End Hardware Co., Boston	78	July
D-197	CHAS. C. HART SEED CO., Wethersfield, Conn. Large Bell, or Blue Nose Pepper..... The Church & Stowell Co., Wareham	34 (R)	July
D-84	F. H. WOODRUFF & SONS, Milford, Conn. Long Red Cayenne Pepper..... Fitchburg Hardware Co., Fitchburg (2)	0 (R)	July
<b>PUMPKIN</b>			
D-216	JOSEPH BRECK & SONS CORP., Boston, Mass. Small Sugar Pumpkin..... Geo. E. Warren, Braintree	74 (R)	July
D-295	ROSS BROS. CO., Worcester, Mass. Small Sugar Pumpkin..... Casey's Big General Store, Milford	84	July
<b>RADISH</b>			
D-221	JOSEPH BRECK & SONS CORP., Boston, Mass. Scarlet Globe Radish..... Winer's Hardware Co., Randolph	88	July
D-302	THOMAS W. EMERSON CO., Boston, Mass. Early Deep Scarlet Turnip Radish..... Uxbridge Hardware & Furniture Co., Uxbridge	91	July
D-191	Flat Top Radish..... Schultz Hardware Co., Scituate	68 (R)	July
D-47	FERRY-MORSE SEED CO., Detroit, Mich. Early Scarlet Globe Radish..... Sears, Roebuck & Co., Pittsfield	85	May
D-52	FREDONIA SEED CO., Fredonia, N. Y. Long White Icicle Radish..... C. A. Pierce & Son, Hinsdale	84 (R)	Aug.
D-139	THOMAS J. GREY CO., Boston, Mass. Early Scarlet Globe Radish..... Thomas J. Grey Co., Boston	85	July
D-313	CHAS. C. HART SEED CO., Wethersfield, Conn. Early Scarlet Globe Radish..... Kelton's Market, Holden	80 (R)	Aug.
D-105	Early Scarlet Globe Radish..... Waite Hardware Co., Southbridge	75 (R)	Aug.
D-198	Early Scarlet White Tipped Radish..... The Church & Stowell Co., Wareham	74 (R)	July
D-179	French Breakfast Radish..... East Dedham Hardware Co., East Dedham	80 (R)	July
D-234	HAWKINS SEED CO., Reading, Vt. Vick's Early Scarlet Globe Radish..... Downey & Howland Hardware Co., Fall River	72 (R)	July
D-116	D. LANDRETH SEED CO., Bristol, Pa. French Breakfast White Tip Radish..... P. A. Richards Hardware Co., Spencer	86	July
D-38	PAGE SEED CO., Greene, N. Y. Early Scarlet Turnip Radish..... The Clifford Co., Lenox	81 (R)	May
D-125	PERRY SEED CO., Boston, Mass. Early Scarlet Globe Radish..... Perry Seed Co., Boston	87	July
D-275	JEROME B. RICE SEED CO., Cambridge, N. Y. Scarlet Turnip Radish..... Stanley Hardware Co., Haverhill	89	July

Note:—(R) indicates a retest. (2) Old seed.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>RADISH—Continued</b>			
D-214	ROSS BROS. CO., Worcester, Mass. Early Round Scarlet Radish..... Geo. E. Warren, Braintree	71 (R)	July
D-28	Early Round Scarlet White Tipped Radish..... Greenfield Farmers' Cooperative Exchange, Greenfield	83 (R)	May
D-149	French Breakfast Radish..... Harvard Square Hardware Co., Cambridge	64 (R)	July
D-85	F. H. WOODRUFF & SONS, Milford, Conn. French Breakfast Radish..... Fitchburg Hardware Co., Fitchburg	77 (R)	July
D-6	Scarlet Glow Radish..... Frank Pouchot, Springfield	72 (R)	May
D-34	White Tip Scarlet Radish..... F. I. Webster Co., Turners Falls	78 (R)	May
<b>RUTABAGA</b>			
D-23	CHAS. C. HART SEED CO., Wethersfield, Conn. Rutabaga..... Mason A. Dickinson, Amherst	94	May
<b>SALSIFY</b>			
D-240	COMSTOCK, FERRE & CO., Wethersfield, Conn. Salsify..... J. O. Neill Co., Fall River (2)	0 (R)	June
D-40	PAGE SEED CO., Greene, N. Y. Mammoth Sandwich Island Salsify..... The Clifford Co., Lenox	71	May
<b>SPINACH</b>			
D-222	JOSEPH BRECK & SONS CORP., Boston, Mass. Bloomsdale Spinach..... Winer's Hardware, Randolph	80	July
D-239	COMSTOCK, FERRE & CO., Wethersfield, Conn. Savoy Spinach..... J. O. Neill Co., Fall River	77 (R)	Aug.
D-278	THOMAS W. EMERSON CO., Boston, Mass. Round Thick Leaf Spinach..... Eastman's Hardware Co., Falmouth	65 (R)	July
D-219	NORTHRUP, KING & CO., Minneapolis, Minn. Bloomsdale Spinach..... Morgan Hardware, Randolph	72 (R)	Aug.
D-62	Bloomsdale Spinach..... F. W. Woolworth Co., North Adams	80	May
<b>SPINACH, NEW ZEALAND</b>			
D-143	JOSEPH BRECK & SONS CORP., Boston, Mass. New Zealand Spinach..... Harvard Coop. Society, Cambridge	68 (R)	July
D-160	New Zealand Spinach..... South End Hardware Co., Boston	76	July
D-229	THOMAS W. EMERSON CO., Boston, Mass. New Zealand Spinach..... Johnson Hardware & Paint Co., Wrentham	65 (R)	July
D-303	New Zealand Spinach..... Uxbridge Hardware & Furniture Co., Uxbridge	53 (R)	July
<b>SQUASH</b>			
D-223	JOSEPH BRECK & SONS CORP., Boston, Mass. Green Hubbard Squash..... Winer's Hardware Co., Randolph	70 (R)	Aug.
D-238	COMSTOCK, FERRE & CO., Wethersfield, Conn. Giant Summer Straightneck Squash..... J. O. Neill Co., Fall River	84 (R)	Aug.
D-192	THOMAS W. EMERSON CO., Boston, Mass. Blue Hubbard Squash..... Schantz Hardware Co., Scituate	87	June

Note:—(R) indicates a retest. (2) Old seed.



## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>SQUASH—Continued</b>			
D-169	FERRY-MORSE SEED CO., Detroit, Mich. Summer Squash..... Coggan-Sherman Co., Malden	74 (R)	Aug.
D-79	CHAS. C. HART SEED CO., Wethersfield, Conn. Blue Hubbard Squash..... Davis Hardware Co., Gardner	93	May
D-19	BUDD D. HAWKINS, Reading, Vt. Summer Golden Crookneck Squash..... W. D. Miller, East Northfield	77 (R)	May
D-324	JEROME B. RICE SEED CO., Cambridge, N. Y. Early White Bush Scallop Squash..... H. E. Bingham, Hardwick	85 (R)	Aug.
D-67	Giant Early Summer Crookneck Squash..... C. F. Glennon, Dalton	92	June
D-309	Giant Early Summer Crookneck Squash..... Kelton's Market, Holden	87 (R)	Aug.
D-297	ROSS BROS. CO., Worcester, Mass. Green Hubbard Squash..... Casey's Big General Store, Milford	89	June
D-153	STERLING SEED CO., Minneapolis, Minn. Golden Summer Squash..... Newberry Co., Chelsea	57 (R)	June
D-33	F. H. WOODRUFF & SONS, Milford, Conn. Blue Hubbard Squash..... F. I. Webster Co., Turners Falls	91	May
<b>SWISS CHARD</b>			
D-151	JOSEPH BRECK & SONS CORP., Boston, Mass. Lucullus Swiss Chard..... Stadium Hardware Co., Cambridge	94	July
D-315	FERRY-MORSE SEED CO., Detroit, Mich. Spinach Swiss Chard..... Nellie I. Griffin, Rutland	86	July
D-165	Spinach Beet Swiss Chard..... Centre Hardware Co., Malden	84	July
D-94	NORTHRUP, KING & CO., Minneapolis, Minn. Swiss Chard..... Elwood Adams, Inc., Worcester	88	July
D-29	ROSS BROS. CO., Worcester, Mass. Swiss Chard..... Greenfield Farmers' Cooperative Exchange, Greenfield	70	June
<b>TOMATO</b>			
D-147	JOSEPH BRECK & SONS CORP., Boston, Mass. Stone Tomato..... Morrison-MacGowan Co., Cambridge	57 (R)	Aug.
D-241	COMSTOCK, FERRE & CO., Wethersfield, Conn. Bonny Best Tomato..... J. O. Neill Co., Fall River	73 (R)	Aug.
D-291	D. M. FERRY SEED CO., Detroit, Mich. Earliana Tomato..... J. D. Hilliard, Provincetown	87	July
D-51	FREDONIA SEED CO., Fredonia, N. Y. Beefsteak Tomato..... C. A. Pierce & Son, Hinsdale	71 (R)	Aug.
D-254	CHAS. C. HART SEED CO., Wethersfield, Conn. Hart's Improved New Stone Tomato..... F. W. Carson Hardware Co., Dedham	69 (R)	Aug.
D-18	BUDD D. HAWKINS, Reading, Vt. Chalk's Early Jewel Tomato..... W. D. Miller, East Northfield	84	May
D-235	Chalk's Early Jewel Tomato..... Downey & Howland Hardware, Fall River	65 (R)	July
D-27	NORTHRUP, KING & CO., Minneapolis, Minn. Chalk's Early Jewel Tomato..... F. W. Woolworth Co., Greenfield	81	May

Note:—(R) indicates a retest.

## 1933 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Concluded

## VEGETABLES—Concluded

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1933 Month of Test
<b>TOMATO—Continued</b>			
NORTHROP, KING & CO.,—Continued			
D-154	Sparks Earliana Tomato. Bellingham Hardware Co., Chelsea	83	July
D-323	Sparks Earliana Tomato. W. E. Bingham, Hardwick	95	July
D-71	PAGE SEED CO., Greene, N. Y. Earliana Tomato. R. A. Stacey & Sons, Williamstown	78 (R)	Aug.
D-187	JEROME B. RICE SEED CO., Cambridge, N. Y. Improved Chalk's Jewel Tomato. G. W. Hunt, South Duxbury	95	July
D-118	Ponderosa Tomato. C. F. Wheeler's Estate, West Brookfield	86	July
D-294	ROSS BROS. CO., Worcester, Mass. Dwarf Champion Tomato. Casey's Big General Store, Milford	62 (R)	Aug.
D-87	F. H. WOODRUFF & SONS, Milford, Conn. Bonny Best Tomato. Fitchburg Hardware Co., Fitchburg	86	July
<b>TURNIP</b>			
D-167	AMERICAN SEED CO., Detroit, Mich. Purple Top Turnip. Kresge Co., Everett	56 (R)	Aug.
D-157	CROSMAN SEED CO., E. Rochester, N. Y. Purple Top White Globe Turnip. Neisners Bros., Inc., Boston	70 (R)	July
D-193	THOMAS W. EMERSON CO., Boston, Mass. White Egg Turnip. Schultz Hardware Co., Scituate	95	July
D-227	American Purple Top Turnip. Johnson Hardware & Paint Co., Wrentham	84 (R)	July
D-176	CHAS. C. HART SEED CO., Wethersfield, Conn. Purple Top Turnip. E. J. Keelan, Dedham	89	July
D-42	White Egg Turnip. Berkshire Hardware Co., Pittsfield	88 (R)	Aug.
D-24	White Egg Turnip. Mason A. Dickinson, Amherst	84	May
D-135	HOVEY & CO., Boston, Mass. Purple Top White Globe Turnip. Hovey & Co., Boston	82 (R)	Aug.
D-58	LAKE SHORE SEED CO., Dunkirk, N. Y. Ruta Baga Turnip. P. J. Vrabel Hardware Co., Adams	38 (R)	May
D-115	D. LANDRETH SEED CO., Bristol, Pa. Yellow Flesh Purple Top Ruta Baga Turnip. P. A. Richards Hardware Co., Spencer	94	July
D-283	JEROME B. RICE SEED CO., Cambridge, N. Y. Purple Top Strap Leaf Turnip. Central Hardware Co., Hyannis	98	July
D-316	ROSS BROS. CO., Worcester, Mass. White Egg Turnip. S. I. Simenson & Co., Barre	92	July
D-249	F. H. WOODRUFF & SONS, Milford, Conn. Macomber Turnip. Sanford Hardware Co., Fall River	93	July
D-83	Red Top Globe Turnip. Fitchburg Hardware Co., Fitchburg	83 (R)	July
<b>WATERMELON</b>			
D-311	JEROME B. RICE SEED CO., Cambridge, N. Y. Kleckley's Sweet Watermelon. Kelton's Market, Holden	70 (R)	June

Note:—(R) indicates a retest.

## Laboratory and Field Germination Tests of Sweet Corn

Seed Laboratory, Departments of Botany and Vegetable Gardening Cooperating

The purpose of this project is two-fold: First, to compare germination results obtained in the seed testing laboratory with those obtained in the field, in order to evaluate the relation between field and laboratory testing of sweet corn, so that from careful observation of the laboratory germination test one may be able to predict the field performance of the same seed; and second, to determine the kinds of disease organisms that occur in commercial lots of sweet corn and their effects upon germination both in the laboratory and in the field. Official rules for seed testing were followed in making all tests.

In the laboratory the rag-doll method was used; that is, the seeds were placed between folds of moist paper toweling, rolled up, and wrapped in a sheet of oiled paper. Tests were alternated between germinators which are kept at constant temperatures of 20° and 30° C. They were allowed to remain in the 30° oven for a period of 8 hours and then placed in the 20° oven for 16 hours. Preliminary counts of the germinated seeds were made after tests had been in the ovens 3 days, a second record taken after 5 days, and a final one at the end of 8 days. Some varieties of sweet corn germinate much more quickly than others, but 8 days seems to be the maximum requirement for most varieties. During the 1933 season 200 seeds each of 253 samples were tested. Three divisions were considered in the germination readings: Normal sprouts, abnormal seedlings, and dead or otherwise non-viable seeds. To be called normal a seedling must have produced a strong plumule and a vigorous root system, it must be apparently disease-free, and the root and shoot must be of good measure, depending upon the variety of corn. Seedlings were classed as abnormal because of weakness as shown by slow development or effect of disease. All tests were critically examined and records kept of percentages of normal and abnormal seedlings, as well as of the kinds and percentages of disease present in each lot.

Field plantings were made in carefully prepared soil, 200 seeds of corn being planted from each sample that had been tested in the laboratory. The soil was rather moist and heavy, and the temperature was cool during the test period. Preliminary counts of plants were made at the end of 2 weeks. After 4 weeks the plants were removed from the soil and final observations recorded. Normal and abnormal plants were counted. All plants were inspected for disease and findings carefully tabulated.

The following is a summary of the results, with interpretations.

- |  |                 |
|--|-----------------|
| 1. Number of seed lots germinated in the laboratory and in the field. .... | 253             |
| 2. Germination in the laboratory (average of all lots)                     | <i>Per Cent</i> |
| a. Abnormal due to diseased roots or shoots. ....                          | 8.9             |
| b. Abnormal due to other causes. ....                                      | 2.7             |
| c. Dead or otherwise non-viable seeds. ....                                | 6.5             |
| d. Normal germination. ....  | 81.9            |
| 3. Total emergence in field (average of all lots).....                     | 71.3            |
| a. Weak and diseased seedlings. ....                                       | 0.7             |
| b. Normal germination. ....  | 70.6            |

The probable reasons why the laboratory germination was higher than the field germination are: First, laboratory conditions of moisture and temperature are nearer the optimum requirements for germination than field conditions; second,

a final reading was made 3 days after the usual 5-day count, thus allowing some slow seedlings to be included in normals; and third, conditions in the field test happened to favor the activity of molds and other seed-borne organisms which caused more kernel decay during and before germination in the field than occurred in the laboratory.

#### Summary of the Mold and Disease Readings

1. The most common molds that occurred in the laboratory germinations were species of *Rhizopus*, but *Mucor*, *Penicillium*, *Aspergillus*, and *Cladosporium* were also present.

2. Molds were observed in 92.7 per cent of the lots tested in the laboratory; and Scutellum Rot, caused largely by *Rhizopus* and other molds, in 96.5 per cent.

3. Molds (mostly *Rhizopus*) caused root infection in the laboratory trials in a larger number of lots than any other single fungus, such as *Fusarium*, *Gibberella*, *Diplodia*; and in nearly as many lots as those three types of fungi combined. Although injury to the seedlings appeared not necessary for infection by any of those organisms, yet *Penicillium* infection occurred mostly at breaks in both the roots and shoots.

4. There appeared to be no definite relation between the amount of molds in a rag-doll and the amount of seedling infection caused by molds. Some lots with heavy mold contaminations showed little or no seedling infection; while others with light molds may have shown marked infection. Perhaps the variety was an important factor.

5. In the laboratory the presence of molds in the germinator, together with prominent Scutellum Rot, appeared to have little effect upon germination. For example: 50 lots that were selected for light-to-very-light molds averaged only 3.6 per cent higher normal germination than 50 lots that showed heavy-to-very-heavy mold contamination. This difference might well be accounted for by the slightly greater amount of seedling infection in the heavy-mold series.

6. On the other hand, in the field emergence test, the same series of low-mold lots averaged 22.3 per cent higher normal germination than the heavy-mold lots. Furthermore, the low-mold series averaged almost as high germination in the field as in the laboratory, being only 3.5 per cent lower in the field; whereas, in the heavy mold series there was a difference of 21.3 per cent in favor of laboratory over field germination.

7. It is believed that the greater depressing effect of molds on normal germination in the field test was due to kernel decay before and during germination. In the laboratory, kernel decay by the molds had not progressed beyond the Scutellum Rot stage at the time the final readings were made.

8. In the laboratory test, kernel discolorations due to such seed-borne disease fungi as *Fusarium*, *Gibberella*, *Diplodia*, *Alternaria*, *Hormodendron*, *Cephalosporium*, and *Basisporium*, were attended by only slight reduction in normal germination, and the same was true in the field test. For example: 77.5 per cent of the lots germinated in the laboratory showed "pink" kernels, varying from 1 to 42 per cent of the kernels in a lot, and caused by species of *Fusarium*, *Cephalosporium*, and *Gibberella*; yet 50 lots which contained from none to 3 per cent

of "pinks" averaged only 3.3 per cent higher germination in the laboratory than another series of 50 lots with from 4 to 42 per cent "pinks."

9. The same may be said in part for kernel discolorations caused by *Diplodia*, *Hormodendron*, *Basisporium*, and *Alternaria*. In proportion to the number or percentage of discolored kernels in a given lot of seed, *Diplodia* appeared to have a greater depressing effect upon germination in both the laboratory and the field than any one of the other seed-borne disease organisms except *Rhizopus*. It appeared to infect the roots of seedlings more readily than *Fusarium* or *Gibberella*, and perhaps as readily as *Rhizopus*.

10. Although soil conditions might be considered ideal for growth of most of the seed-borne fungi which commonly cause seedling blight and root, stalk and ear rots of corn, yet they exerted no such depressive effect upon emergence in the field germination test as did the presence of moderate-to-heavy mold contaminations under the same field conditions.

11. Since the field-maturity planting was located in the same place where the corresponding test was grown last year, little dependence could be placed upon the disease readings that were made during the growing season, because most of the seed-borne disease organisms are able to winter over in refuse in the soil and attack the second-year crop. Exception might be made in the case of Bacterial Wilt or Stewart's Disease which is not definitely known to be carried over from one year to the next in the field.

12. Stewart's Disease was observed as primary infection in 25 lots, ranging from 1 to 6 per cent of the stalks. Seven lots showed primary infection of bacterial spot (*Bacterium holci*).

13. Other diseases that may have had their origin with the seed were black bundle (*Cephalosporium acremonium*); stalk and ear rot due to *Gibberella* sp. and *Fusarium* spp. and *Diplodia zeae*; also, a spotting or mottling of foliage which was perhaps virus in character.

In a season with copious rainfall during field germination, but not excessive wetting of the soil, and with rather a heavy type of soil for the emergence test, ample opportunity was afforded to ascertain the effects of molds and other disease organisms carried with the seed upon normal germination. Molds, particularly *Rhizopus* spp., reduced normal germination much more in the field than was suspected might occur. On the other hand, although there was evidence that all such seed-borne disease fungi as species of *Fusarium*, *Gibberella*, and *Diplodia* in particular, reduced emergence and normal germination in the field, yet the occurrence of abnormals from seedling infection by those fungi was not as extensive as might be expected judging from the amount of kernel discoloration and root infection found in the laboratory series. In many instances lots comparatively free from molds but showing considerable seedling infection in the laboratory from *Fusarium* or *Diplodia* gave higher normal germination in the field than in the laboratory, indicating that such organisms might not affect germination in the field as much as in the laboratory--even when there are few or no abnormals from other causes concerned.

Such germination tests as these conducted with sweet corn in 1933 should furnish valuable information not only to seedsmen and growers, but also to analysts and any others who are interested in the relation of laboratory germination tests to emergence and normal germination in the field, as well as in the effects of various seed-borne fungi upon germination in both the laboratory and the field.

### **Type and Variety Studies of Sweet Corn**

**Conducted in Conjunction with the Department of Vegetable Gardening  
Prof. Grant B. Snyder**

The field trials of sweet corn for 1933 included 280 lots consisting of 90 different named sorts from 29 sources. The seed was purchased in all cases from the seed firm or grower. In conducting the trials every effort was made to maintain as uniform cultural conditions as possible and to evaluate plant and ear characters on a fair basis.

Detailed records were taken of each lot as to plant, ear, and kernel characters and season of maturity. Refractive indices were taken of kernels for 29 of the more important sorts during their maturity periods. Kernel toughness was studied by use of a pressure tester for 15 varieties during their maturity periods and under varied conditions after harvesting. These records are available to anyone interested by communication with the Department of Vegetable Gardening.

In general, the sorts included were true in type for the variety designated by the seedsman. The more standard varieties exhibited very little variation, while the newer sorts such as Golden Gem, Spanish Gold, Top and King's Crossed Bantam, showed some variation in plant height, maturity season, rows of kernels per ear, and kernel size. These variations, however, were not sufficient to classify the sort as being off-type or misnamed, except as noted below.

Golden Gem, S. D. Woodruff & Sons: Lot resembled Spanish Gold.

Spanish Gold, S. D. Woodruff & Sons: Plant taller and later in maturity than typical for variety.

Golden Sunshine, Thomas W. Emerson Co.: Plant shorter than Sunshine, with ears similar to Golden Early Market.

Golden Sunrise, Thomas W. Emerson Co.: Resembled Golden Sunshine.

Pocahontas, J. J. Gregory & Son: Lot variable.

Stowell's Evergreen, Harris Seed Co.: Lot shorter and earlier in maturity than other strains of variety tested.

While some variation in size of ear and number of rows of kernels per ear was noted for the various sorts studied, very few deviated from a permissible tolerance. In Golden Bantam, those strains having 10 to 14 rows per ear were largely listed as Improved Golden Bantam. This distinction from the standard Golden Bantam, which has 8 rows per ear, is quite desirable. It was also noted that the hybrid sorts, as Top Crossed Bantam, etc., were somewhat more resistant to Stewart's Disease than the standard varieties.

### **Type and Variety Tests of Legumes**

**Conducted in Conjunction with the Department of Agronomy**

Continuing the project of trueness to type and variety of legumes, which the Department of Agronomy has conducted for several seasons, 14 samples of Alfalfa, 29 samples of Red Clover, and 3 samples of Sweet Clover were tested. All samples were found true to type for the variety labeled by the vendor of the seed.



MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN NO. 73

OCTOBER, 1934

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**Fourteenth Annual Report on  
Eradication of Pullorum Disease  
in Massachusetts**

By the Poultry Disease Control Laboratory

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The purpose of this bulletin is to report the results of pullorum disease testing for the 1933-34 season. In the discussion of the results an effort has been made to point out what factors have been overlooked as well as those that have been observed in eradicating pullorum disease from the flocks.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.



# FOURTEENTH ANNUAL REPORT ON PULLORUM DISEASE ERADICATION IN MASSACHUSETTS

1933-34

By the Poultry Disease Control Laboratory<sup>1</sup>

## Introduction

The purpose of pullorum disease testing in the State of Massachusetts is to establish and to identify pullorum disease-free flocks in order that poultrymen may prevent losses from this disease due to decreased fertility and hatchability, chick and adult mortalities, and reduced sales. Testing records extending over a period of fourteen years clearly show that much progress has been made in establishing pullorum disease-free flocks. The accomplishment in eradication of the disease in many of the flocks is largely attributed to persistent testing under State supervision, together with the cooperation received from flock owners, members of the Poultry Department, Massachusetts State College, State Extension Service, and other agencies.

## Reduction in Price of Testing

During the past year the price of testing was reduced to seven cents per bird, including the cost of the legband. This price is the same or less than that charged in neighboring states where the testing work is conducted in a similar manner. While certain agencies, principally those having a commercial interest, have advocated a test which is lower in price, this laboratory has maintained the policy that the poultry industry in this State deserves a high quality service which will yield results upon which a sound business can be constructed. However, an effort is made to perform the testing operations at the lowest cost possible, in order to extend this service to the greatest possible number of poultry breeders, without sacrificing accuracy or reliability of the results.

### *Summary of Service Rendered*

Applications received.....	278
Applications cancelled.....	16
Flocks tested.....	262
Number of tests.....	284,916
Chickens.....	284,848
Fowl other than chickens:	
Routine.....	14
Experimental.....	54
Owners receiving necropsy service.....	41
Necropsies of reacting birds.....	83

<sup>1</sup>Poultry Disease Control Laboratory Staff:—H. Van Roekel, Chief of Laboratory; K. L. Bullis and D. M. Yegian, Assistant Veterinary Pathologists; O. S. Flint, Assistant Research Professor; Miriam K. Clarke and Felicia Zimnoski, Laboratory Assistants. Appreciation is extended to Dr. J. B. Lentz for assistance given to the testing work.

TABLE 1.—DISTRIBUTION OF TESTS AND REACTORS, BY COUNTIES AND BY BREEDS

Breed	Barnstable	Berkshire	Bristol	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Suffolk	Worcester	Totals	Per Cent Positive Tests
(Total tests	2,421	2,721	24,962	17,887	17,805	9,291	15,918	43,893	62,213	17,036	546	39,219	253,612	
Rhode Island Reds.....(Positive tests	0	24	175	4	128	63	7	91	607	128	0	133	1,360	0.54
(Total tests	92	1	520	1,430	180		603	6,547	969	2,215		860	13,417	
Barred Plymouth Rocks (Positive tests	0	0	107	0	0		2	9	0	0		1	119	0.89
(Total tests			197	900			40	2,043	908	4,960		642	9,690	
White Plymouth Rocks. (Positive tests			0	0			0	0	0	0		0	0	0
(Total tests		3,190	1,180	542	32		435		185			266	5,830	
White Leghorns.....(Positive tests		27	0	0	0		5		0			0	32	0.55
(Total tests							19	558	1,361				1,938	
White Wyandottes.....(Positive tests							1	0	0				1	0.05
(Total tests	92		59	59			6	5				140	361	
Miscellaneous.....(Positive tests	0		0	0			0	0				0	0	0
Total Tests.....	2,605	5,912	26,918	20,818	18,017	9,291	17,021	52,746	65,636	24,211	546	41,127	284,848	
(Number	0	51	282	4	128	63	15	100	607	128	0	134	1,512	
Positive Tests.....(Per cent	0.00	0.86	1.05	0.02	0.71	0.68	0.09	0.19	0.92	0.53	0.00	0.33	0.53	

### Distribution of Tests and Reactors

As shown in Table 1, 12 counties submitted a total of 284,848 samples to the laboratory. The percentage of positive samples was 0.53. Norfolk, Middlesex, and Worcester Counties had the largest number of tests. Two counties, Barnstable and Suffolk, had no reactors among the tested birds. Four counties had less than one-half of 1 per cent positive tests among the birds tested, while in only one county (Bristol) were the total positive tests greater than 1 per cent.

### Value of Annual Testing

Table 2 shows that 37 flocks were tested for the first time, representing 14,140 tests, of which 1.26 per cent were positive. In the intermittent group 21 flocks were tested, which revealed 1.30 per cent positive tests. In both these groups the percentages of positive tests are lower than those for the same groups in previous years. Although the number of birds represented is small, it appears that the effect of continuous testing for 14 years in this State has expressed itself in these two groups. The stock in some of these flocks is progeny of pullorum disease-free breeding stock.

TABLE 2.—ANNUAL TESTING VERSUS SINGLE AND INTERMITTENT TESTING

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Per Cent	100% Tested	Partially Tested	100% Tested	Partially Tested
Tested for the first time. ....	37	13,952	14,140	178	1.26	17	10	5	5
Intermittent testing. ....	21	12,142	13,303	173	1.30	6	8	4	3
Two consecutive years. ....	26	11,551	11,733	332	2.83	9	12	3	2
Three or more consecutive years	178	225,596	245,672	829	0.34	124	43	7	4
Totals. ....	262	263,241	284,848	1,512	0.53	156	73	19	14

Among the 26 flocks tested for two consecutive years, the percentage of positive tests was 2.83. The fact that this percentage is higher than in any of the other three groups is explained in part by one flock in this group which revealed 61.23 per cent reactors.

It is encouraging to note that of the total number (262) of flocks tested, 178 have been tested for three or more consecutive years. Approximately 86 per cent of the tests, of which 0.34 per cent were positive, represent flocks tested for three or more consecutive years. Further, only 11 of the 178 flocks were classified as infected, which points out that through annual testing, supplemented by effective preventive measures, flocks can be maintained free from pullorum disease. The maintenance of such a large nucleus of pullorum-free flocks will in turn effectively establish a larger group of free flocks through properly controlled

distribution of eggs, baby chicks, and adult stock. The flock owners of pullorum-clean flocks are justified in priding themselves on the fact that they have so conclusively demonstrated that they were capable of establishing and maintaining flocks free of this disease. Furthermore, the owners of pullorum-clean flocks have realized a mental satisfaction, as well as financial saving, as the result of no losses suffered from pullorum infection.

The percentage of flock owners who tested all the birds on the premises has increased from 52.6 in 1932-33 to 66.8 in 1933-34. The soundness of testing all birds on the premises cannot be ignored, because the exact status of a flock cannot be determined with any degree of certainty by testing only part of the birds.

### Appearance of Infection in Flocks Previously Negative

During the 1933-34 season infected birds were found in 12 flocks that had been negative for one or more years. Table 3 shows that in all but three of these flocks the percentage of reactors was less than one. The source of the infection

TABLE 3.—INFECTED FLOCKS WITH A PREVIOUS NEGATIVE TESTING HISTORY

Flock No.	Number of Years Negative	1933-34 Season			Explanation
		Flock Total	Number Tested	Positive Tests Percent	
1	5	1,599 1,394	1,598 *1,394	0.19 0.00	Unsatisfactory
2	2	987	962	5.93	Possible purchase of infective eggs
3	3	3,036 2,946	3,036 *246	0.07 0.00	Unsatisfactory
4	1	790	689	0.29	Custom hatching and purchase of questionable stock
5	3	1,382 1,016	1,382 *1,015	0.87 0.00	Purchase of eggs from questionable stock
6	7	2,788 2,791	2,788 *491	0.11 0.00	Unsatisfactory
7	5	1,810 1,494	1,560 1,488	0.38 0.00	Purchased eggs from an infected source
8	3	872 711	321 *261	10.59 1.15	Purchased chicks from untested source
9	2	1,468 1,431	1,168 271	0.68 2.21	Practices custom hatching
10	4	1,660 1,447	1,510 *1,356	0.31 0.00	No information
11	4	1,310	1,310	0.23	Unsatisfactory
12	3	1,295	1,295	0.08	Unsatisfactory

\*Represents retests.

could not be accounted for in all cases. Custom hatching and the purchase of questionable or infected stock were in most cases responsible for the infection. This points out the fact that persons introducing new stock should make a very thorough investigation of the disease status of the flock. Since purchases of new blood lines are not apt to be made on the spur of the moment, as a rule, there is ample opportunity to determine the true status of a flock from which stock is desired.

The value of annual testing is again manifest in these 12 flocks. The fact that the majority of the so-called "breaks" revealed less than 1 per cent reactors suggests that the infection had not had the opportunity to multiply, as would have been the case if the infected birds had been permitted to remain in the flock undetected to perpetuate and increase the amount of infection. Generally when re-infection occurs, the smaller the amount the less difficult it is to eradicate.

The number of re-infected flocks can be reduced to a minimum only when poultrymen conscientiously adopt measures that prevent the introduction of infection.

### Non-Reacting and Positive Flocks Classified by Counties

Table 4 shows that at the close of the testing season 229 non-reacting flocks, representing 212,782 birds, were identified in 12 counties. Middlesex County had the largest number (43) of non-reacting flocks, representing 45,183 birds. A total of 33 positive flocks was detected in 10 counties. The number of birds in these flocks was 50,459, approximately equal to one-fourth the number of non-reacting flocks. No positive flocks were detected in Barnstable and Suffolk Counties. Middlesex and Worcester Counties had the largest number of positive flocks.

It is, indeed, encouraging to observe that approximately four-fifths of the total tested birds are found in non-reacting flocks. Having increased the ratio between the number of birds in positive and non-reacting flocks in favor of the latter, one is led to believe that the number of positive flocks will be reduced to a minimum in the near future. The time may not be far distant when the testing program can be so conducted that all flocks can be credited with at least one negative test. This is entirely plausible since, as the number of positive flocks becomes less, more attention and special consideration might be given to them in order to establish non-reacting flocks. Furthermore, the owners of non-reacting flocks should bear in mind that the number of positive flocks would also be less if they prevented re-infection in their flocks. By following up the different avenues through which infection is spread, and instituting the necessary preventive measures, the foci of infection may be gradually eliminated. When a free flock is once established there is no danger of re-infection, unless it be through uncontrollable and unknown avenues which appear to play a very insignificant role, according to our present knowledge. Therefore, it rests with the poultrymen to observe effective preventive measures in an eradication program, since without this cooperation the testing and control agencies can make little or no progress.

TABLE 4.—NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
<b>Non-Reacting Flocks</b>						
Barnstable.....	2	2,605	—	—	2	2,605
Berkshire.....	2	4,529	3	193	5	4,722
Bristol.....	13	14,430	17	9,114	30	23,544
Essex.....	15	13,250	8	7,351	23	20,601
Franklin.....	13	16,430	—	—	13	16,430
Hampden.....	11	7,042	1	1,249	12	8,291
Hampshire.....	15	11,400	5	2,326	20	13,726
Middlesex.....	30	35,129	13	10,054	43	45,183
Norfolk.....	13	18,026	9	4,927	22	22,953
Plymouth.....	16	17,370	6	3,420	22	20,790
Suffolk.....	1	546	—	—	1	546
Worcester.....	25	26,057	11	7,334	36	33,391
Totals.....	156	166,814	73	45,968	229	212,782
<b>Positive Flocks</b>						
Berkshire.....	1	625	1	383	2	1,008
Bristol.....	2	2,883	—	—	2	2,883
Essex.....	—	—	1	217	1	217
Franklin.....	2	1,587	—	—	2	1,587
Hampden.....	2	1,000	—	—	2	1,000
Hampshire.....	1	1,310	2	641	3	1,951
Middlesex.....	7	5,508	2	831	9	6,339
Norfolk.....	1	28,397	2	317	3	28,714
Plymouth.....	—	—	2	751	2	751
Worcester.....	3	3,541	4	2,468	7	6,009
Totals.....	19	44,851	14	5,608	33	50,459

### Comparison of 1932-33 and 1933-34 Seasons

In Table 5 a brief summary of results of the last two seasons is presented. A comparison of data reveals a decrease in the number of tested flocks, tested birds, tests, and non-reacting flocks, also a slight increase in the percentage of positive tests. While there have been decreases in the number of flocks, birds, and tests, yet the percentage of birds in the non-reacting flocks was slightly greater in 1933-34 than in the previous season. These data show that the testing has dropped off considerably in certain counties. It may be questioned whether the flock owners in these counties realize and appreciate the time, effort, and expenditure required to bring their flocks to the status of pullorum disease freedom, which should not be jeopardized by the discontinuation of the testing program that has demonstrated itself to be effective in establishing and maintaining pullorum-clean flocks. Some poultrymen have resorted to the whole-blood test, for which they pay less, but the results obtained are not reliable in the minds of those who are interested in complete eradication of the disease as well as in determining the true status of the flock.

Pullorum disease testing in Massachusetts is not in its infancy. It is an established, progressive movement benefiting the poultrymen with increasing

TABLE 5.—COMPARISON OF 1932-1933 AND 1933-1934 TESTING

County	Flocks	Birds	Tests	Positive Tests Per Cent	Non-Reacting Flocks
<b>1932-1933 Season</b>					
Barnstable.....	4	4,289	4,414	2.51	2
Berkshire.....	5	5,676	5,676	1.74	2
Bristol.....	56	42,523	42,597	0.45	42
Dukes.....	1	960	1,228	2.93	0
Essex.....	30	25,375	27,227	0.68	27
Franklin.....	12	9,027	9,268	0.09	11
Hampden.....	12	8,365	8,983	0.08	12
Hampshire.....	25	15,034	15,512	1.11	20
Middlesex.....	53	50,667	50,889	0.33	43
Norfolk.....	36	53,174	53,205	0.30	31
Plymouth.....	53	42,121	42,730	0.22	48
Suffolk.....	1	565	565	0.00	1
Worcester.....	47	38,317	38,420	0.48	37
Totals.....	335	296,093	300,714	0.47	276
<b>1933-1934 Season</b>					
Barnstable.....	2	2,605	2,605	0.00	2
Berkshire.....	7	5,730	5,912	0.86	5
Bristol.....	32	26,427	26,918	1.05	30
Essex.....	24	20,818	20,818	0.02	23
Franklin.....	15	18,017	18,017	0.71	13
Hampden.....	14	9,291	9,291	0.68	12
Hampshire.....	23	15,677	17,021	0.09	20
Middlesex.....	52	51,522	52,746	0.19	43
Norfolk.....	25	51,667	65,636	0.92	22
Plymouth.....	24	21,541	24,211	0.53	22
Suffolk.....	1	546	546	0.00	1
Worcester.....	43	39,400	41,127	0.33	36
Totals.....	262	263,241	284,848	0.53	229

proportions each year. Our primary object at the present time is to maintain the flocks free of the disease and to establish additional clean flocks through closely supervised testing and supervised replacements from known free flocks. Haphazard testing, which in this instance means testing one year and not the next, employing unreliable testing methods, indiscriminate buying of stock and failure to observe effective eradication and preventive measures, all lead to failure in the eradication of pullorum disease. Massachusetts poultrymen cannot afford to lose what has been gained through 14 years of persistent testing in eradicating the disease from their flocks.

MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 74

NOVEMBER, 1934

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Inspection of Commercial  
Fertilizers

By H. D. Haskins

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This is the sixty-first report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

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Massachusetts State College  
Amherst, Mass.



# INSPECTION OF COMMERCIAL FERTILIZERS FOR THE SEASON OF 1934

By H. D. Haskins, Official Chemist <sup>1</sup>

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## MANUFACTURERS AND BRANDS

Registrations have been perfected in Massachusetts during 1934 by 95 firms, covering 439 brands of mixed fertilizer and unmixed fertilizing materials. The nature of these products is shown by the following classification:

Complete fertilizers . . . . .	265
Ammoniated superphosphates . . . . .	3
Superphosphates with potash . . . . .	1
Dry ground fish, tankage and ground bone . . . . .	47
Fertilizer simples, including organic nitrogen compounds . . . . .	77
Tobacco stems . . . . .	1
Pulverized manures . . . . .	26
Cotton hull ashes and wood ashes . . . . .	3
Peat products . . . . .	9
Stone meal . . . . .	2
Nitrate of potash . . . . .	5
<b>Total . . . . .</b>	<b>439</b>

<sup>1</sup> Assisted by H. Robert DeRose, Albert F. Spelman, J. W. Kuzmeski, Raymond D. Coldwell, Chemists; James T. Howard, C. L. Whiting, A. G. Brigham, G. E. Taylor, Sampling Agents; Harry L. Allen, Laboratory Assistant; Cora B. Grover, Clerk.

Samples of the following brands were not drawn as they were not found on display by our sampling agents.

### Brands of Fertilizer Registered but Not Sampled.

MANUFACTURER AND BRAND.	MANUFACTURER AND BRAND.
<b>Armour Fertilizer Works</b> Armours Big Crop Fertilizers 2-12-4 Armours Big Crop Fertilizers 5-8-10 Fish (9-6-0)	<b>Collins Seed Service Co.</b> Complete Grass Manure 6-8-1
<b>Ashcraft-Wilkinson Co.</b> Monarch Brand Cotton Seed Meal (6.88-0-0)	<b>Spencer Kellogg &amp; Sons, Inc.</b> Castor Pomace (4.62-0-0)
<b>Bisbee Linseed Co.</b> Bisbee Brand 34% Protein Pure Old Process Linseed Meal (5-0-0)	<b>Shelton Co., Inc.</b> Golden Gate Sheep Manure (1-1-1)
<b>Buckeye Cotton Oil Co.</b> Buckeye 41% Protein Prime Cottonseed Meal (6.56-0-0)	<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b> Standard United States 3 x 12 x 5 Standard United States 4 x 8 x 7 Standard United States 4 x 8 x 10 Standard United States 5 x 8 x 5 Standard United States 6 x 3 x 6
<b>Cairo Meal &amp; Cake Co.</b> Miss Cairo Brand 41% Prime Cottonseed Meal (6.58-0-0)	

### Drawing of Samples.

Between April 1 and June 15, four sampling agents made a thorough canvass of the state: James T. Howard in Hampshire, Hampden, Franklin, and Berkshire counties; A. G. Brigham in Worcester County; G. E. Taylor in Norfolk, Bristol, Plymouth, Barnstable, and Dukes counties; and C. L. Whiting in Essex, Middlesex, and Suffolk counties. They visited 202 towns, took 1,688 samples, representing 421 brands, from stock in the possession of 550 agents or owners, and called upon 285 agents where no samples were drawn because the agency had been discontinued, the stock was all sold out, or sufficient samples had already been taken of the brands found. They sampled 17,935 sacks representing 7,433 tons of fertilizer. One ton was sampled to every seven and seven-eighths tons sold in the state.

### COMPARATIVE COST OF FERTILIZER CHEMICALS AND UNMIXED FERTILIZER PRODUCTS.

The price of both ammonium sulfate and sodium nitrate has advanced during the year and while the former has held steady at the advanced price, the latter salt has shown a decline of about \$1 per ton from the six months' average ending March 1, 1934. Calcium nitrate and potassium nitrate have sold for somewhat less per ton in 1934 than during the previous year: the latter salt was quoted at \$5.65 per ton less on September 24 than for the six months' average ending March 1. Most of the organic ammoniates have shown a decided advance in price over 1933, and with the exception of synthetic urea and dry ground fish had shown no decline in price on September 24, 1934.

Superphosphate has shown a small but consistent advance in price during the season.

All potash salts have shown a decline in price during the season, ranging from \$2.50 per ton in case of sulfate of potash-magnesia, to over \$15 per ton in case of muriate.

In view of the above it seems quite likely that the price of mixed fertilizers for 1935 will be somewhat lower than during the past season.

The following table gives average quotations taken from the Oil, Paint and Drug Reporter and Chemical Markets.

## Wholesale Quotations on Chemicals and Unmixed Materials.

NATURE OF MATERIAL.	AVERAGE PRICE PER TON FOR SIX MONTHS PRECEDING MARCH 1.		Price Per Ton Sept. 24, 1934.	Difference Between Sept. 24 Price and Six Months' Average: Sept. 1, 1933- Mar. 1, 1934.
	1933.	1934.		
Ammonium sulfate (20.5% N), 200 lb. bags, northern ports	\$22.58	\$26.48	\$26.50	none
Nitrate of soda (15.5% N), bags, natural or synthetic, ex vessel	25.68	26.44	25.50	-\$0.94
Nitrate of lime (15% N), bags, northern ports, ex vessel	26.33	25.72	26.50	+.78
Nitrate of potash (13% N, 44% K <sub>2</sub> O), bags, c.i.f. ports	56.65	53.65	48.00	-5.65
Urea (46% N), car lots, bags, ex vessel	82.60	104.72	100.00	-4.72
Dried blood (12.34% N), ground, bulk, New York	24.66	39.18	48.00	+8.82
Hoof meal (14.15% N), f.o.b. Chicago	15.12	32.08	34.40	+2.32
Animal tankage (8.23% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), ground, bulk, New York	17.30	26.35	31.50	+5.15
Dry ground fish (9.02% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), bags, Baltimore	30.50	40.92	39.00	-1.92
Cottonseed meal (5.75% N), bags, at mill	15.24	21.29	30.00	+8.71
Castor pomace (4.52% N), bags, car lots, f.o.b. works	12.45	17.12	18.50	+1.38
Ground bone (2.47% N, 22.88% P <sub>2</sub> O <sub>5</sub> ), bags, f.o.b. Chicago	17.40	21.73	16.00	-5.73
Superphosphate (16% avail. P <sub>2</sub> O <sub>5</sub> ), bulk, f.o.b. Baltimore	7.29	7.92	8.50	+.58
Muriate of potash (50.54% K <sub>2</sub> O), bags	37.15	37.15	22.00	-15.15
High grade sulfate of potash (48.65% K <sub>2</sub> O), bags	47.50	42.15	35.00	-7.15
Potash-magnesia sulfate (25.94% K <sub>2</sub> O), bags	27.80	25.00	22.50	-2.50
Cotton hull ashes (25% K <sub>2</sub> O), bulk, delivered, car lots	33.75	33.75	21.25	-12.50

The following fertilizer trade values are based on average wholesale quotations of fertilizer chemicals and unmixed materials, as taken from trade journals for six months ending March 1, 1934, to which 20 per cent has been added for overhead. When appropriate, an additional allowance has also been made for bags, labor and transportation.

## Fertilizer Trade Values.

FORM OF PLANT FOOD.	Value per Pound.	Unit Value.
Nitrogen.		
In ammonia salts	\$0.075	\$1.50
In nitrates	.1025	2.05
Organic nitrogen in fish	.21	4.20
Organic nitrogen in blood, meat and hoof meal	.175	3.50
Organic nitrogen in fine <sup>1</sup> bone and tankage	.2075	4.15
Organic nitrogen in coarse <sup>1</sup> bone and tankage and in pulverized manures	.14	2.80
Organic nitrogen in mixed fertilizers	.1725	3.45
Organic nitrogen in cottonseed meal, castor pomace, linseed meal, etc.	.2375	4.75
Organic nitrogen in urea and calurea	.11	2.20
Organic nitrogen in cyanamid	.078	1.56
Phosphoric Acid.		
Soluble in water and neutral citrate of ammonia (available)	.0475	.95
In fine <sup>1</sup> bone, tankage and fish	.0475	.95
In coarse <sup>1</sup> bone and tankage	.0425	.85
In pulverized manures, seed residues, and ashes	.0425	.85
Insoluble in neutral citrate of ammonia in mixed fertilizers	.02	.40
Potash.		
As sulfate	.048	.96
As muriate	.039	.78
As nitrate	.039	.78
As carbonate	.095	1.90
In pulverized manures, seed residues, and the water insoluble portion in ashes	.04	.80

<sup>1</sup> Fine bone and tankage refers to particles which, as sampled, will pass through a sieve with circular openings 1/50 of an inch in diameter. Coarse bone and tankage refers to that portion which will not pass through the sieve.

## FERTILIZER TONNAGE.

## Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts.

	July 1, 1931, to July 1, 1932.	July 1, 1932, to July 1, 1933.	July 1, 1933, to July 1, 1934.
Mixed fertilizers	39,689	37,076	40,160
Fertilizer chemicals and materials unmixed	20,325	16,451	15,870
Pulverized natural manures	1,939	1,443	1,614
Totals	61,953	54,970	57,644

There were 2,674 tons more fertilizer sold in the state in 1934 than during the previous year. The tonnage of mixed fertilizer was 3,084 more, and that of the fertilizer chemicals and unmixed materials was 581 less than for 1933. Pulverized manures showed an increase of 181 tons. Of the total tonnage sold, 70 per cent was mixed fertilizer, 27 per cent was unmixed materials, and 3 per cent was dried and pulverized natural manures.

## Plant Food Tonnage.

	Nitrogen.		Phosphoric Acid.		Potash.	
	1933.	1934.	1933.	1934.	1933.	1934.
Mixed fertilizers	1,845	2,028	3,078	3,438	2,408	2,745
Fertilizer chemicals and materials unmixed	1,187	1,144	1,343	1,344	400	484
Pulverized natural manures	31	33	21	24	40	44
Totals	3,063	3,205	4,442	4,806	2,848	3,273

There were 931 more tons of plant food sold in Massachusetts than during 1933, of which 142 tons were nitrogen, 364 tons available phosphoric acid, and 425 tons potash.

There were 11,284 tons of plant food sold, of which 28 per cent was nitrogen, 43 per cent available phosphoric acid, and 29 per cent potash. Mixed fertilizers furnished 73 per cent of the plant food, chemicals and unmixed materials 26 per cent, and pulverized manures 1 per cent.

The three plant food elements were furnished in the following proportions by the mixed fertilizers and the unmixed materials, including the pulverized manures: nitrogen, 63 per cent from mixed and 37 per cent from unmixed; phosphoric acid, 72 per cent from mixed and 28 per cent from unmixed; potash, 84 per cent from mixed and 16 per cent from unmixed.

The following tables present tonnage figures for the period from July 1, 1933, to July 1, 1934, for both mixed fertilizers and unmixed fertilizer materials. In the case of the mixed fertilizers the grade represents the plant food guarantee of each fertilizer and is expressed in the order of nitrogen, available phosphoric acid, potash.

## (a) Tonnage of Mixed Fertilizers.

## COMPLETE FERTILIZERS.

*14 Per Cent or More of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash.)*

Grade.	Tonnage.	Brands.	Grade.	Tonnage.	Brands.
5-8-7	13,346	27	4-8-5	73	-
4-8-4	8,399	27	2-12-4	69	-
4-8-7	3,013	23	2-8-10	68	-
4-8-10	2,310	16	12-4-4	66	-
7-6-6	1,415	10	5-8-6	66	-
4-8-8	1,085	-	5-9-8	64	-
3-10-4	1,080	7	9-6-6	62	-
5-8-10	762	6	6-6-4	59	-
4-12-4	651	-	3-8-4	59	-
8-16-16	591	-	6-6-5	57	-
6-3-6	488	7	12-16-12	54	-
8-16-14	468	9	10-6-4	53	-
6-3-7	416	-	15-30-15	53	-
6-8-6	375	-	13-10-2	52	-
5-10-4	330	-	6-15-9	46	-
4-10-4	329	-	6-11-10	45	-
5-10-10	304	-	3-7-6	45	-
3-10-6	276	-	7-5-2	40	-
5-6-4	237	-	10-16-20	35	-
4-6-10	190	-	10-3-3	29	-
5-3-6	157	-	5-8-5	27	-
7-12-10	157	-	8-6-6	26	-
2-10-2	157	-	5-12-6	26	-
8-5-8	136	-	5-7-2	25	-
6-7-4	122	-	7-8-5	20	-
8-6-2	116	-	5-9-9	18	-
5-10-5	111	-	10-5-10	17	-
10-16-14	109	-	8-8-8	16	-
5-5-5	93	-	12-6-4	16	-
7-13-11	92	-	4-16-20	16	-
5-8-12	86	-	4-16-4	15	-
8-24-8	82	-	7-5-3	15	-
5-4-15	81	-	Miscellaneous	457	25
4-10-6	74	-	Totals	39,378	247

*Less than 14 Per cent of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash.)*

5-3-5	564	8	4-3-5	20	-
4-2-2	50	-	5-6-2	18	-
4-2-1	47	-	Miscellaneous	31	4
4-3-2	40	-	Totals	770	18

## SUPERPHOSPHATE WITH POTASH.

0-14-6	12	-
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Of the 40,148 tons of complete fertilizer guaranteed to contain 14 per cent or more of available plant food, 76 per cent was furnished by 7 grades and 114 brands. Double- and multiple-strength grades totaled 1,449 tons and 22 brands, which was 480 tons more than during the previous year.

Of the mixed fertilizer sold, 98 per cent contained 14 per cent or over of available plant food, compared with 97 per cent in 1933.

There were 244 tons less of low-analysis (less than 14 per cent available plant food) complete fertilizers sold than in 1933. The 5-3-5 grade, comprising 8 brands, furnished 73 per cent of the tonnage of these low-analysis goods. About 91 per cent was furnished by 4 grades, comprising 11 brands.

## (b) Tonnage of Unmixed Fertilizing Materials.

MATERIAL.	Tonnage.	Brands.	MATERIAL.	Tonnage.	Brands.
Superphosphate . . .	4,466	14	Ground tobacco stems.	115	-
Nitrate of soda . . .	2,288	6	Nitrate of potash . . .	114	5
Ground bone . . .	1,905	26	Dry ground fish . . .	102	9
Pulverized animal manures	1,614	26	Basic slag phosphate . .	71	-
Cottonseed meal . . .	1,453	9	Sulfate of potash . . .	64	-
Cyanamid . . .	1,117	-	Linseed meal . . .	60	-
Sulfate of ammonia . . .	867	9	Wood ashes . . .	55	-
Muriate of potash . . .	685	7	Double superphosphate	48	-
Milorganite . . .	594	-	Calcium nitrate . . .	36	-
Peat . . .	476	9	Precipitated bone . . .	29	-
Animal tankage . . .	443	10	Urea . . .	20	-
Cal-Nitro . . .	266	-	Ammo-Phos . . .	18	-
Stone Meal . . .	251	-	Miscellaneous . . .	29	9
Castor pomace . . .	154	8			
Cotton hull ashes . . .	149	-	Totals . . .	17,489	171

The tonnage of unmixed materials was distributed as follows: nitrogen products, 39 per cent; phosphoric acid products, 26 per cent; potash products, 5 per cent; tankage, fish, bone, nitrate of potash, ammo-phos, tobacco stems, and wood ashes, 16 per cent; and miscellaneous, 14 per cent.

Ten of the most popular grades of mixed fertilizer are listed in the following table in comparison with a similar list for 1933.

1933.		1934.	
GRADE.	Tonnage.	GRADE.	Tonnage.
5-8-7 . . . . .	10,817	5-8-7 . . . . .	13,346
4-8-4 . . . . .	8,287	4-8-4 . . . . .	8,399
4-8-7 . . . . .	2,858	4-8-7 . . . . .	3,013
4-8-10 . . . . .	1,557	4-8-10 . . . . .	2,310
7-6-6 . . . . .	1,361	7-6-6 . . . . .	1,415
3-10-4 . . . . .	1,162	4-8-8 . . . . .	1,085
6-3-6 . . . . .	1,040	3-10-4 . . . . .	1,080
5-3-5 . . . . .	786	5-8-10 . . . . .	762
5-8-10 . . . . .	602	4-12-4 . . . . .	651
4-12-4 . . . . .	577	8-16-16 . . . . .	591

The five fertilizer grades sold during 1934 in Massachusetts in the largest tonnage were likewise recorded and in the same order during 1933, as will be seen from the above table. The 4-8-8 had the sixth largest tonnage in 1934. This grade which in composition is very similar to the 4-8-7, differing only by a one per cent increase in potash, very likely reflects the advertising propaganda of the potash exporters. It is questionable whether the 4-8-8 grade would on the average in Massachusetts prove more effective than would the 4-8-7 grade.

The tobacco grades 6-3-6 and 5-3-5, which had the seventh and eighth largest tonnage in 1933, dropped to twelfth and eleventh place, respectively; due largely, no doubt, to the curtailment in acreage devoted to this crop in 1934. Only 2,092 acres of tobacco were grown in Massachusetts in 1934, 1,696 acres being grown under contract with the government and 396 acres not under contract; 5,154 acres were rented to the government on which no tobacco was grown. There was about a 75 per cent reduction in the tobacco acreage in Massachusetts in 1934. The seventh and eighth places were held this year by the 3-10-4 and 5-8-10 grades, which in 1933 occupied sixth and ninth place respectively.

The 4-12-4 grade, which had the tenth largest tonnage in 1933, was in the ninth place during the past year. The 8-16-16 grade, which is a double strength

4-8-8, had the tenth largest tonnage in 1934. This really gives the 4-8-8 type fifth place as regards tonnage sold.

The following table shows how the tonnage sold in 1934 corresponds with the nine grades selected in 1931 by the New England agronomists.

NEW ENGLAND STANDARD NINE GRADES.	Tonnage.	Additional Tonnage from Grades Varying but 1% in One or More Plant Foods.	Total.
5-8-7 . . . . .	13,455 <sup>a</sup>	4,603	18,058
4-8-4 . . . . .	8,562 <sup>b</sup>	159	8,721
4-8-10 . . . . .	2,318 <sup>c</sup>	18	2,336
7-6-6 . . . . .	1,415	84	1,499
6-3-6 . . . . .	505 <sup>d</sup>	1,146	1,652
3-10-4 . . . . .	1,080	336	1,416
2-12-4 . . . . .	69	8	77
5-8-10 . . . . .	797 <sup>e</sup>	19	816
2-8-10 . . . . .	84 <sup>f</sup>	-	84
Total . . . . .	28,285	6,373	34,659

<sup>a</sup> Including 109 tons of 10-16-14.

<sup>b</sup> Including 111 tons of 5-10-5 and 53 tons of 15-30-15.

<sup>c</sup> Including 8 tons of 8-16-20.

<sup>d</sup> Including 17 tons of 10-5-10.

<sup>e</sup> Including 35 tons of 10-16-20.

<sup>f</sup> Including 16 tons of 4-16-20.

Of the total tonnage of mixed fertilizer sold in Massachusetts, 70 per cent was from grades recommended in 1931 by New England Agronomists to meet New England conditions, and 16 per cent additional tonnage was from grades varying but one per cent in one or more plant food elements from the grades thus recommended. Of the ten grades, including the multiple strength mixtures, that have the highest tonnage (34,345 tons), all but four were among the New England Standard Nine. These six grades showed a total tonnage of 27,627.

Nearly 18 per cent of the total tonnage of mixed fertilizer was from five grades not included in the New England Standard Nine. They are 4-8-7, third largest tonnage sold; 4-8-8, sixth largest; 4-12-4, ninth largest; 8-16-16, tenth largest; and 5-3-5, eleventh largest.



**MIXED FERTILIZERS.**  
**Deficiency Statistics for Mixed Fertilizers.**

MANUFACTURER.	NUMBER OF BRANDS.		NUMBER OF TESTS OR DETERMINATIONS.				
	Analyzed.	Approximately Equal to Guarantee in Commercial Valuation.	Totals. (a)	Not Exceeding $\frac{1}{4}$ Per Cent Below Guarantee.	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee.	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee.	More than $\frac{3}{4}$ Per Cent Below Guarantee.
Acme Guano Co.	6	6	18	0	1	0	0
American Agricultural Chemical Co.	44	44	132	13	5	0	1
America Soda Products Co.	1	1	3	0	0	0	0
Anderson's Nurseries	1	1	3	0	0	0	0
Apothecaries Hall Co.	13	13	39	4	0	2	0
Armour Fertilizer Works	16	16	48	8	1	0	0
Barrie Laboratories, Inc.	1	1	3	0	0	0	0
F. A. Bartlett Tree Expert Co., Inc.	1	1	3	0	0	0	0
Berkshire Chemical Co.	11	11	33	0	0	0	0
Joseph Breck & Sons Corp.	1	1	3	0	0	0	0
Clay & Son, Ltd.	1	1	3	0	0	0	0
Collins Seed Service Co.	2	2	6	0	0	0	0
Consolidated Rendering Co.	20	20	60	2	1	0	0
Davey Tree Expert Co.	1	1	3	1	0	0	0
Eastern States Farmers' Exchange	16	16	47	1	0	0	0
Thomas W. Emerson Co.	1	1	3	0	0	0	0
Fertilawn Co.	1	1	3	0	0	0	1
H. L. Frost & Higgins Co.	2	2	6	0	1	1	0
Gouldard & Olena, Inc.	1	0	3	0	0	0	1
T. J. Grey Co.	1	1	3	0	1	0	0
Thomas Hersom & Co.	2	2	6	0	0	0	0
International Agricultural Corp.	14	14	42	7	2	0	1
Little Tree Farms	1	1	3	0	0	0	0
Lowell Fertilizer Co.	9	9	27	4	0	0	0
Miller Fertilizer Co.	9	9	27	1	2	1	1
Old Deerfield Fertilizer Co., Inc.	19	19	57	0	1	0	0
Olds & Whipple, Inc.	10	10	30	1	0	0	0
Pedigreed Seed Co., Inc.	1	1	3	0	0	0	1
F. G. Phillips Co.	1	1	3	0	0	0	0
Plantabbs Corp.	1	1	3	0	0	0	0
Arthur B. Porter, Inc.	1	1	3	0	0	0	0
Rogers & Hubbard Co.	22	22	66	1	2	0	1
F. S. Royster Guano Co.	3	3	9	0	0	0	0
Salem Chemical & Supply Co.	1	1	3	0	0	0	0
O. M. Scott & Sons Co.	1	1	3	0	0	0	0
M. L. Shoemaker & Co., Inc.	1	1	2	0	0	0	0
Smith Agricultural Chemical Co.	1	1	3	0	0	0	0
Standard Wholesale Phosphate & Acid Works, Inc.	3	3	9	1	1	0	0
Stimulant Laboratories, Inc.	1	1	3	0	0	0	0
Swift & Co.	2	2	6	0	1	0	0
F. Sylvester & Son	1	1	3	0	0	0	0
Synthetic Nitrogen Products Corp.	1	1	3	1	0	0	0
Tennessee Corp.	2	2	6	0	0	0	0
Van Horne Chemical Co.	1	1	3	0	0	0	1
Victory Fertilizer Corp.	3	3	9	0	1	0	0
Virginia-Carolina Chemical Corp.	2	2	6	0	0	0	0
Vita-Liza Co.	2	2	6	2	0	1	0
C. P. Washburn Co.	3	3	9	1	0	0	0
Winslow Nurseries	1	1	3	0	0	0	0

a Several analyses of the same brand have been averaged and recorded in the table as one analysis. Analyses of fertilizer left over from previous year not included.



## Summary of Deficiencies in Mixed Fertilizers

	1932.	1933.	1934.
Brands deficient in one element . . . . .	59	86	67
Brands deficient in two elements . . . . .	9	6	7
Brands deficient in three elements . . . . .	0	1	0
Brands deficient in nitrogen . . . . .	18	16	22
Brands deficient in available phosphoric acid . . . . .	27	41	22
Brands deficient in potash . . . . .	32	44	37

## Serious Commercial Shortages in Mixed Fertilizers

AMOUNT OF SHORTAGE PER TON.	NUMBER OF BRANDS ACCORDING TO YEARS.			
	1931.	1932.	1933.	1934.
More than \$5 . . . . .	2	none	1	1
Between \$4 and \$5 . . . . .	none	none	none	none
Between \$3 and \$4 . . . . .	1	2	none	none
Between \$2 and \$3 . . . . .	none	none	2	none
Between \$1 and \$2 . . . . .	3	2	1	1

Of the 260 brands analyzed, 186, or 72 per cent, showed no deficiencies. Out of 778 plant food guarantees made, 90 per cent were fully maintained.

The deficiency table shows the following statistics:

Deficiencies not exceeding  $\frac{1}{4}$  of one per cent, 48.

Deficiencies between  $\frac{1}{4}$  and  $\frac{1}{2}$  of one per cent, 20.

Deficiencies between  $\frac{1}{2}$  and  $\frac{3}{4}$  of one per cent, 5.

Deficiencies more than  $\frac{3}{4}$  of one per cent, 8.

Of the total number of guarantees of each element made, 8 per cent of the nitrogen, 8 per cent of the available phosphoric acid, and 14 per cent of the potash were not met. Thirteen of the 22 nitrogen deficiencies, 11 of the 22 available phosphoric acid deficiencies, and 24 of the 37 potash deficiencies did not exceed  $\frac{1}{4}$  of one per cent.

There were 6 more shortages in nitrogen, 19 less in available phosphoric acid, and 7 less in potash, than in 1933.

## Mixing Efficiency Table.

MANUFACTURER.	AVERAGE PERCENTAGE OF PLANT FOOD ABOVE OR BELOW THE MINIMUM GUARANTEE.		
	Nitrogen.	Available Phosphoric Acid.	Potash.
Acme Guano Co. . . . .	+ .31	+ .51	+ .26
American Agricultural Chemical Co. . . . .	+ .19	+ .38	+ .46
Apothecaries Hall Co. . . . .	+ .33	+1.18	+ .47
Armour Fertilizer Works . . . . .	+ .09	+ .17	+ .02
Berkshire Chemical Co. . . . .	+ .39	+ .36	+ .38
Consolidated Rendering Co. . . . .	+ .25	+ .43	+ .39
Eastern States Farmers' Exchange . . . . .	+ .57	+ .76	+ .99
International Agricultural Corp. . . . .	+ .16	+ .28	+ .20
Lowell Fertilizer Co. . . . .	+ .25	+ .19	+ .34
Miller Fertilizer Co. . . . .	+ .03	+1.05	+ .43
Old Deerfield Fertilizer Co., Inc. . . . .	+ .30	+ .79	+ .39
Olds & Whipple, Inc. . . . .	+ .47	+ .26	+ .80
Rogers & Hubbard Co. . . . .	+ .21	+ .37	+ .51

Thirteen different firms have registered five or more brands of mixed fertilizer. Based upon composition found as well as upon tonnage sold, the above table shows to what extent each manufacturer was successful in guarding against deficiencies in plant food guarantee in his mixtures. All of the thirteen firms provided an overrun in all three of the plant food elements guaranteed. Two manufacturers, however, showed overruns in one element that were insufficient to safely care for accidental variations in the composition of the materials usually selected for use in fertilizer mixtures.

#### **Explanation of Tables of Analyses.**

**Guarantee.** The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer, Brand and Grade," and is expressed as nitrogen, available phosphoric acid and water soluble potash and in that order.

**Commercial Shortages.** In the table designated "Mixtures showing a commercial shortage of \$1 or more per ton," the column headed "Approximate commercial valuation per ton" gives the sum of the valuation of each plant food element computed from the analysis by use of the trade values adopted by the Massachusetts Fertilizer Control for 1934, which appear on a preceding page of the bulletin.

Under the heading "Approximate commercial shortage per ton" is shown the commercial valuation of the deficiencies or tests found below the guarantee after allowance is made for the value of overruns or tests above the guarantee.

Deficiencies are emphasized by boldface type.

**Mixtures Substantially Complying with the Guarantee.** In addition to the analysis of those fertilizers substantially complying with the guarantee, this table includes also those mixtures that are more or less out of balance; that is, having deficiencies in one or more plant food elements, but having overruns which largely offset the value of the deficiencies.

"Number of samples" indicates the number of samples included in the composite which was analyzed.

**Inferior Nitrogen.** The presence of inferior forms of organic nitrogen is indicated by footnotes.

**Potash Forms.** Wherever tests for chlorine showed a sufficient amount present to unite with all of the potash found, the source of the potash is designated as muriate. Wherever insufficient chlorine was found to account for all of the potash it is evident that forms of potash other than muriate were used. In such cases, the figures under the sub-heading "As muriate" do not imply necessarily that muriate of potash was actually added to the mixture, but that chlorine was present, probably from impurities in the fertilizer chemicals, in amounts to account for the percentage of potash indicated. The balance of the potash found is listed under the sub-heading "In forms other than muriate" and may be derived from sulfate, nitrate, or carbonate, as the case may be.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton.

NAME OF MANUFACTURER, BRAND, AND GRADE.	Where Sampled.	Approximate Commercial Valuation Per Ton.	Approximate Commercial Shortage Per Ton.	NITROGEN FOUND.			PHOSPHORIC ACID		POTASH (K <sub>2</sub> O) FOUND.	
				In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.	Available.	As Muriate.	In Forms Other than Muriate.
Goulard & Olena, Inc.										
G & O Plant Food 12-15-20										
International Agricultural Corp.	Brockton	\$43.88	\$6.26	6.76	.69	.59	8.04	15.05	20.16	-
International 8-16-14 (a)	Framingham	38.68	1.50	6.48	.85	.69	8.02	15.50	11.34	1.26
International Caribee 10-16-20 (b)	Woburn	53.09	1.87	4.02	3.37	2.31	9.70	15.85	5.13	13.48
Vita-Liza Co.										
Vita-Liza 4-3-2 (composite of 2 samples) (c)	{ Buzzards Bay Osterville	16.51	1.56	.16	.10	3.39 <sup>d</sup>	3.65	3.00	-	1.44

<sup>a</sup> Magnesium oxide guaranteed, 1%: found, 1.52%. One other sample showed a commercial shortage of 53 cents; four other samples substantially complied with the guarantee.

<sup>b</sup> Magnesium oxide guaranteed, 2%: found, 2.03%. One other sample showed a commercial shortage of 92 cents; one other sample, a commercial shortage of 91 cents; and one other sample substantially complied with the guarantee.

<sup>c</sup> Two other samples substantially complied with the guarantee.

<sup>d</sup> The water insoluble nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Acme Guano Co.								
1	Acme 2-8-2 . . . . .	2.64	.06	.76	3.46	9.19	5.08	-
1	Acme 4-6-10 . . . . .	3.24	.12	.86 <sup>a</sup>	4.22	8.55	10.37	-
1	Acme 4-8-7 . . . . .	3.38	.31	.77	4.46	8.23	7.69	-
1	Acme 5-8-7 . . . . .	4.82	.55	.62	5.99	8.29	6.72	-
1	Sergents 4-8-4 . . . . .	3.24	none	1.04	4.28	8.54	4.30	-
1	Sergents 4-8-4 . . . . .	3.32	none	.92	4.24	8.35	3.82	-
1	Sergents 4-8-7 . . . . .	3.34	none	.98	4.32	8.48	7.33	-
American Agricultural Chemical Co.								
1	AA 4-8-8 Fertilizer . . . . .	3.14	.57	.64	4.35	8.23	8.09	-
1	AA 8-16-16 Fertilizer . . . . .	6.92	.74	.63	8.29	16.32	17.45	-
1	AA 8-16-16 Fertilizer . . . . .	6.88	.72	.20	7.80	16.96	10.47	5.12
1	AA 8-16-16 Fertilizer . . . . .	6.76	1.19	.20	8.15	16.01	15.88	-
3	AA Aroostook Potato Manure 5-8-7 . . . . .	3.62	.53	.94	5.09	8.42	7.15	-
7	AA Aroostook Potato Manure 5-8-7 . . . . .	3.66	.86	1.05	5.07	8.23	7.02	-
3	AA Aroostook Potato Manure 5-8-7 . . . . .	3.80	.68	.68	5.16	8.04	6.61	-
1	AA Aroostook Potato Manure 5-8-7 . . . . .	3.78	.88	.74	5.40	8.42	6.57	-
3	AA Complete Manure with 10% Potash 4-8-10 . . . . .	2.88	.43	.89	4.20	8.36	9.83	-
5	AA Corn Favorite 3-10-4 . . . . .	2.14	none	1.04	3.18	10.40	4.11	-
3	AA Corn Favorite 3-10-4 . . . . .	2.60	.15	.56	3.31	10.71	4.30	-

<sup>a</sup> The water insoluble nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
American Agricultural Chemical Co. — Continued.								
3	AA Country Club Organic Fertilizer 7-5-2.	2.98	.77	3.90	7.65	6.26	.99	1.57
4	AA Cranberry Fertilizer 5-6-4	3.92	.62	.77	5.31	6.57	4.00	—
1	AA Cranberry Fertilizer 5-6-4	3.92	.76	.57	5.25	6.57	4.03	—
1	AA Double Strength Fertilizer 8-16-14	6.96	1.16	.15	8.27	17.10	11.62	2.06
2	AA Double Strength Fertilizer 8-16-14	6.42	.84	.47	7.73	16.27	14.15	—
1	AA Double Strength Fertilizer 8-16-14	6.82	.99	.17	7.98	16.58	14.73	—
2	AA Monarch Fertilizer 4-8-4	2.42	.83	1.02	4.27	8.61	3.81	—
5	AA Monarch Fertilizer 4-8-4	2.78	.34	1.02	4.14	8.10	4.07	—
1	AA Monarch Fertilizer 4-8-4	2.70	.13	1.03	3.86	8.04	3.97	—
3	AA Monarch Fertilizer 4-8-4	3.10	.43	.82	4.35	8.55	4.81	—
2	AA Peerless Fertilizer 4-8-7	2.98	.27	.77	4.02	8.29	7.05	—
3	AA Potato Grower 5-8-10	3.58	.83	.96	5.37	8.54	9.79	—
2	AA Potato Grower 5-8-10	3.62	.77	.84	5.23	8.16	10.48	—
3	AA Prolific 10% Potash Fertilizer 2-8-10	1.52	.04	.64	2.20	8.48	9.57	—
1	AA Tobacco Starter 5-5-15	2.80	.87	1.53	5.20	5.43	—	14.87
3	AA Top Dresser 7-6-6	5.92	.99	.59	7.50	6.50	5.75	.26
8	AA Top Dresser 7-6-6	5.46	1.18	.50	7.14	6.63	5.86	.19
4	AA Top Dresser 7-6-6	5.94	1.17	.44	7.55	6.19	6.01	—
6	Agrico for Aroostook with 10% Potash 5-8-10	2.46	.82	1.82	5.10	8.54	9.61	—
1	Agrico for Aroostook with 10% Potash 5-8-10	3.38	1.14	.85	5.37	8.61	9.54	—
1	Agrico for Aroostook with 10% Potash 5-8-10	3.44	.67	1.01	5.12	8.93	9.19	—
1	Agrico for Aroostook with 10% Potash 5-8-10	3.58	.92	.67	5.17	8.29	10.23	—

2	Agrico for Corn 3-10-6	.	.	.	.	2.22	none	1.12	3.34	10.78	6.10
7	Agrico for Corn 3-10-6	.	.	.	.	2.20	none	1.00	3.20	10.59	5.93
2	Agrico for Corn 3-10-6	.	.	.	.	2.54	.07	.76	3.37	10.65	6.26
3	Agrico for Fruit 9-6-6	.	.	.	.	7.66	.93	.45	9.04	6.38	5.87
1	Agrico for Fruit 9-6-6	.	.	.	.	7.04	.92	.65	8.61	7.59	5.78
3	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	5.34	1.15	.68	7.17	6.70	6.30
2	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	5.62	.82	.82	7.26	6.89	6.63
2	Agrico for New England 4-8-10	.	.	.	.	2.64	.54	.92	4.10	8.36	10.00
7	Agrico for New England 4-8-10	.	.	.	.	2.66	.81	.75	4.22	8.23	9.88
1	Agrico for New England 4-8-10	.	.	.	.	3.04	.48	.68	4.20	8.29	10.00
5	Agrico for Potatoes and Vegetables 5-8-7	.	.	.	.	3.52	.45	1.15	5.12	8.16	6.86
8	Agrico for Potatoes and Vegetables 5-8-7	.	.	.	.	3.42	.81	.96	5.19	8.10	7.31
1	Agrico for Potatoes and Vegetables 5-8-7	.	.	.	.	3.82	.73	.77	5.32	8.80	7.00
1	Agrico for Potatoes Double Strength 8-16-14	.	.	.	.	6.68	.90	.40	7.98	15.69	13.43
1	Agrico for Potatoes Double Strength 8-16-20	.	.	.	.	7.04	.63	.65	8.32	18.94	19.06
3	Agrico for Tobacco 6-3-6	.	.	.	.	1.12	none	4.96	6.08	3.25	7.49
1	Agrico for Tobacco 6-3-6	.	.	.	.	1.44	.68	4.26	6.38	3.57	6.74
1	Agrico for Truck 5-10-5	.	.	.	.	4.04	.22	.74	5.00	10.27	5.10
4	Bowker's All Round Fertilizer 3-10-4	.	.	.	.	2.42	none	.97	3.39	10.40	4.13
3	Bowker's All Round Fertilizer 3-10-4	.	.	.	.	2.20	.10	.88	3.18	10.27	4.03
2	Bowker's All Round Fertilizer 3-10-4	.	.	.	.	2.64	.31	.65	3.60	10.14	4.90
3	Bowker's Market Garden Fertilizer 4-8-4	.	.	.	.	2.84	.73	.75	4.32	8.48	4.57
10	Bowker's Market Garden Fertilizer 4-8-4	.	.	.	.	2.60	.40	1.16	4.16	8.41	4.48
2	Bowker's Market Garden Fertilizer 4-8-4	.	.	.	.	2.78	.57	.86	4.21	8.35	4.01
3	Bowker's Stockbridge Early Crop Manure 5-8-7	.	.	.	.	3.58	.92	.82	5.32	8.48	6.83
8	Bowker's Stockbridge Early Crop Manure 5-8-7	.	.	.	.	3.38	.84	.90	5.21	8.22	6.78
2	Bowker's Stockbridge Early Crop Manure 5-8-7	.	.	.	.	3.92	.41	.87	5.20	9.76	6.82
2	Bowker's Stockbridge Potato and Vegetable Manure 4-8-10	.	.	.	.	2.82	.36	.92	4.10	8.48	10.02
8	Bowker's Stockbridge Potato and Vegetable Manure 4-8-10	.	.	.	.	2.86	.48	.83	4.17	8.49	10.06
1	Bowker's Stockbridge Truck Manure 4-8-7	.	.	.	.	3.04	.48	.82	4.36	8.48	7.60
1	Bowker's Stockbridge Truck Manure 4-8-7	.	.	.	.	3.06	.24	.79	4.07	8.10	6.45
5	Bradley's Blood, Bone and Potash Brand 5-8-7	.	.	.	.	3.60	.61	1.05	5.26	8.16	6.77
3	Bradley's Blood, Bone and Potash Brand 5-8-7	.	.	.	.	3.58	.58	1.01	5.17	8.61	6.55

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.			Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.		Total.	As Muriate.	In Forms Other than Muriate.
American Agricultural Chemical Co. — Concluded.								
5	Bradley's Complete Manure for Potatoes and Vegetables 4-8-7	2.88	.37	.83	4.08	8.16	6.92	
2	Bradley's Complete Manure for Potatoes and Vegetables 4-8-7	2.78	.42	.89	4.09	8.29	7.02	
3	Bradley's Complete Manure with 10% Potash 4-8-10	2.92	.43	.94	4.29	8.04	9.90	
1	Bradley's Complete Manure with 10% Potash 4-8-10	3.06	.74	.78	4.58	8.35	9.19	
2	Bradley's Complete Manure with 10% Potash 4-8-10	2.94	.37	.81	4.12	8.36	10.68	
5	Bradley's Northland Fertilizer 4-8-4	2.72	.42	.96	4.10	8.74	4.01	
1	Bradley's Northland Fertilizer 4-8-4	2.84	.39	.89	4.12	8.92	4.48	
1	Bradley's Northland Fertilizer 4-8-4	2.80	.36	.94	4.10	8.86	4.03	
6	Bradley's XL Fertilizer 3-10-4	2.14	none	.94	3.08	10.14	4.75	
2	Bradley's XL Fertilizer 3-10-4	2.54	.33	.73	3.60	10.01	5.28	
1	Bradley's XL Fertilizer 3-10-4	2.32	.06	.69	3.07	10.21	4.19	
2	Co-Op 4-8-4 Fertilizer	2.84	.48	.79	4.11	8.23	3.76	
2	Co-Op 4-8-4 Fertilizer	2.78	.47	.89	4.14	8.23	4.32	
1	Co-Op 4-8-7 Fertilizer	3.04	.59	.92	4.55	8.17	7.09	
3	Co-Op 5-8-7 Fertilizer	3.52	.76	.92	5.20	8.29	6.78	
2	Co-Op 5-8-7 Fertilizer	3.82	.66	.75	5.23	8.23	6.84	
1	Co-Op 5-8-7 Fertilizer	3.98	.28	.81	5.07	8.29	6.55	
2	Co-Op 7-6-6 Fertilizer	5.46	.91	.84	7.21	6.44	5.81	
2	Co-Op 7-6-6 Fertilizer	6.16	.42	.60	7.18	6.83	6.10	
1	Co-Op 8-16-14 Fertilizer	6.84	.81	.20	7.85	15.88	13.72	
1	Co-Op 8-16-14 Fertilizer	6.96	.93	.40	8.29	17.53	12.48	
1	National Complete Tobacco Fertilizer 5-3-5	1.18	.42	3.46	5.06	3.38	5.45	





## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Apothecaries Hall Co. — Concluded.								
1	Windsor High Grade Corn 2-12-4	1.80	.17	.56	2.53	11.48	4.75	—
2	Windsor High Grade Market Gardeners 5-8-7	2.84	2.07	.48	5.39	8.48	7.33	—
1	Windsor High Grade Market Gardeners 5-8-7	2.74	2.33	.33	5.40	8.03	7.87	—
3	Windsor Market Gardeners Special 4-8-4	2.14	1.41	.57	4.12	8.74	4.03	—
1	Windsor Market Gardeners Special 4-8-4	2.68	1.12	.57	4.37	8.42	3.93	—
1	Windsor Market Gardeners Special 4-8-4	2.80	1.21	.44	4.45	8.42	4.63	—
1	Windsor Potato & General Crops 4-8-10	2.78	1.25	.21	4.24	7.97	10.95	—
1	Windsor Top Dresser for Grass & Grain 8-8-8	5.50	2.26	.89	8.65	8.74	7.80	.53
1	Windsor Top Dresser for Grass & Grain 8-8-8	5.90	2.12	.54	8.56	9.69	8.03	—
Armour Fertilizer Works								
1	Armours Big Crop Fertilizers 2-10-2	1.76	.21	.76	2.73	10.33	2.13	—
1	Armours Big Crop Fertilizers 3-10-4	2.50	.47	.38	3.35	10.07	4.53	—
5	Armours Big Crop Fertilizers 4-8-4	2.90	.46	.67	4.03	8.04	4.03	—
2	Armours Big Crop Fertilizers 4-8-4	2.80	.56	.59	3.95	7.76	4.26	—
2	Armours Big Crop Fertilizers 4-8-4	2.70	.49	.89	4.08	8.10	3.85	—
3	Armours Big Crop Fertilizers 4-8-7	2.58	.85	.93	4.36	7.91	7.02	—
1	Armours Big Crop Fertilizers 4-8-7	2.70	.46	.88	4.04	8.04	6.64	—
1	Armours Big Crop Fertilizers 4-8-8	3.04	.56	.81	4.41	8.74	8.35	—
3	Armours Big Crop Fertilizers 4-8-10	2.72	.53	1.08	4.33	7.78	10.85	—
2	Armours Big Crop Fertilizers 4-8-10	2.88	.43	.73	4.04	8.35	10.67	—
1	Armours Big Crop Fertilizers 4-8-10	2.92	.45	.68	4.05	8.04	10.56	—

1	Armours Big Crop Fertilizers 4-16-4	.	.	.	.	.	.	.	3.52	.39	.18	4.09	16.58	4.01	—
1	Armours Big Crop Fertilizers 4-16-4	.	.	.	.	.	.	.	3.60	.63	.23	4.46	16.71	3.93	—
2	Armours Big Crop Fertilizers Tobacco Special 5-3-5	.	.	.	.	.	.	.	.24	1.83	2.49	4.56	3.76	—	5.00
1	Armours Big Crop Fertilizers Tobacco Starter 5-5-15	.	.	.	.	.	.	.	.32	4.53	.62	5.47	5.04	3.20 <sup>a</sup>	11.92
4	Armours Big Crop Fertilizers 5-8-7	.	.	.	.	.	.	.	3.54	.51	.95	5.00	8.29	6.84	—
2	Armours Big Crop Fertilizers 5-8-7	.	.	.	.	.	.	.	3.34	.98	.90	5.22	8.29	6.71	—
2	Armours Big Crop Fertilizers 5-8-7	.	.	.	.	.	.	.	2.92	1.32	1.01	5.25	8.36	7.00	—
1	Armours Big Crop Fertilizers 5-8-7	.	.	.	.	.	.	.	2.88	1.46	.99	5.33	4.60	2.12	—
1	Armours Big Crop Fertilizers Tobacco Special 6-3-6	.	.	.	.	.	.	.	.38	2.10	3.27	5.75	3.00	—	6.42
3	Armours Big Crop Fertilizers 6-11-10	.	.	.	.	.	.	.	5.02	.75	.25	6.02	11.09	—	9.86
2	Armours Big Crop Fertilizers 6-11-10	.	.	.	.	.	.	.	4.88	.87	.31	6.06	11.10	9.81	—
3	Armours Big Crop Fertilizers 7-6-6	.	.	.	.	.	.	.	6.08	1.19	.32	7.59	6.37	6.05	—
2	Armours Big Crop Fertilizers 7-6-6	.	.	.	.	.	.	.	5.96	.87	.12	6.95	6.25	5.90	—
1	Armours Big Crop Fertilizers 8-10-14	.	.	.	.	.	.	.	6.42	1.07	.59	8.08	16.20	14.80	—
1	Armours Special Turf Fertilizer 10-8-6	.	.	.	.	.	.	.	9.86	.47	.21	10.54	8.36	6.16	—
2	Armours Vert The Green Colored Plant Food in the Green Bag 5-8-6	.	.	.	.	.	.	.	4.72	.42	.30	5.44	8.67	6.43	—
<b>Barrie Laboratories, Inc.</b>															
1	Barrie's Plant Food 6-4-6	.	.	.	.	.	.	.	.24	1.21	5.91	7.36	6.96	1.23	6.17
1	Bartlett Green Tree Food 6-7-4	.	.	.	.	.	.	.	4.82	.34	1.08	6.24	7.02	1.03	3.54
<b>Berkshire Chemical Co.</b>															
1	Berkshire Complete Tobacco Fertilizer 4-3-5	.	.	.	.	.	.	.	.24	2.07	2.08	4.39	3.00	—	6.10
1	Berkshire Economical Grass Fertilizer 8-8-8	.	.	.	.	.	.	.	.16	7.85	.73	8.74	8.49	—	8.87
2	Berkshire Grass Special Fertilizer 6-6-5	.	.	.	.	.	.	.	4.60	.06	1.62	6.28	6.51	5.19	—
1	Berkshire Grass Special Fertilizer 6-6-5	.	.	.	.	.	.	.	4.34	.50	1.48	6.32	6.25	5.00	—
1	Berkshire High Grade Tobacco Fertilizer 5-3-6	.	.	.	.	.	.	.	.16	1.24	3.72	5.12	3.57	—	7.49
2	Berkshire High Grade Tobacco Fertilizer 5-3-6	.	.	.	.	.	.	.	.26	1.67	3.45	5.38	4.02	—	6.76

<sup>a</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.			Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.		Total.	As Muriate.	In Forms Other than Muriate.
Berkshire Chemical Co. — Concluded.								
7	Berkshire Long Island Special Fertilizer 4-8-7	3.04	none	1.42	8.29	7.25	—	
2	Berkshire Long Island Special Fertilizer 4-8-7	2.86	none	1.50	8.10	7.09	—	
1	Berkshire Long Island Special Fertilizer 4-8-7	3.24	.38	.89	8.29	7.67	—	
7	Berkshire Market Garden Fertilizer 4-8-4	2.68	none	1.63	8.42	4.28	—	
1	Berkshire Market Garden Fertilizer 4-8-4	3.12	none	1.34	8.41	4.36	—	
1	Berkshire Onion Special Fertilizer 4-10-4	2.92	none	1.40	10.20	4.17	—	
1	Berkshire Onion Special Fertilizer 4-10-4	.28	.70	3.73	9.95	4.69	—	
5	Berkshire Potato & Garden Special Fertilizer 5-8-7	3.90	none	1.49	8.41	6.16	1.36	
1	Berkshire Potato & Garden Special Fertilizer 5-8-7	3.94	.06	1.33	8.29	7.29	—	
1	Berkshire Tobacco Special Fertilizer 6-3-7	.26	1.59	4.16	4.15	—	7.66	
1	Berkshire Tobacco Starter Fertilizer 4-4-15	.50	2.29	1.42	4.46	—	15.35	
4	Berkshire Truck Fertilizer 4-8-5	2.50	none	1.87	8.48	5.12	—	
Joseph Breck & Sons Corp.								
1	Breck's Special Market Garden Manure 5-10-10	1.26	1.55	2.51	10.08	1.52 <sup>a</sup>	8.56	
2	Breck's Special Market Garden Manure 5-10-10	1.38	1.43	2.29	10.14	—	10.02	
Clay & Son, Ltd.								
2	Clay's Fertilizer 5-9-2	2.32	none	2.85	9.50	—	2.33	
1	Clay's Fertilizer (1933 stock) (4-1.12-.08)	2.10	.32	2.94	4.97	.10	—	

Collins Seed Service Co.													
1	Casta-Poma Grass Manure 5-6-2	.	.	.	.	.	1.52	.72	2.77	5.01	6.70	1.60	.38
1	Casta-Poma Grass Manure 5-6-2	.	.	.	.	.	1.80	1.13	2.57	5.50	7.08	1.56	.94
1	Complete Grass Manure 6-8-1 (1933 stock)	.	.	.	.	.	3.10	1.09	2.61	6.80	7.53	-	1.34
1	General Purpose Manure 4-8-4 (1933 stock)	.	.	.	.	.	1.10	1.36	1.86	4.32	7.91	2.92	1.23
1	Ver-Best Putting Green Manure 7-8-2	.	.	.	.	.	3.80	.22	3.88	7.90	8.55	1.27	1.21
Consolidated Rendering Co.													
4	Corenco 2-10-2 Bone Brand	.	.	.	.	.	1.18	none	1.13	2.31	10.14	2.25	-
1	Corenco 2-10-2 Bone Brand	.	.	.	.	.	1.10	.78	.44	2.32	10.01	2.65	-
4	Corenco 3-10-4 Animal Brand	.	.	.	.	.	2.20	.07	.98	3.25	10.01	4.79	-
3	Corenco 3-10-4 Animal Brand	.	.	.	.	.	2.50	none	.79	3.29	10.53	4.19	-
2	Corenco 3-10-4 Animal Brand	.	.	.	.	.	1.92	.22	.97	3.11	10.34	4.17	-
6	Corenco 4-8-4 Corn and Vegetable	.	.	.	.	.	2.56	.58	1.11	4.25	8.61	4.31	.50
6	Corenco 4-8-4 Corn and Vegetable	.	.	.	.	.	2.78	.45	1.02	4.25	8.23	4.15	-
6	Corenco 4-8-7 Market Garden	.	.	.	.	.	2.74	.57	.94	4.25	8.42	7.21	-
2	Corenco 4-8-7 Market Garden	.	.	.	.	.	3.10	.48	.66	4.24	8.10	7.58	-
6	Corenco 4-8-10 Potato Grower	.	.	.	.	.	2.66	.53	.98	4.17	8.16	10.29	-
5	Corenco 4-8-10 Potato Grower	.	.	.	.	.	2.72	.30	1.10	4.12	8.10	10.04	-
2	Corenco 4-8-10 Potato Grower	.	.	.	.	.	3.04	.50	.86	4.40	8.29	10.62	-
2	Corenco 4-8-10 with Water Soluble Magnesium 1% (b)	.	.	.	.	.	2.94	.36	.92	4.22	8.55	8.13	2.08
1	Corenco 4-8-10 with Water Soluble Magnesium 1% (b)	.	.	.	.	.	2.98	.38	.76	4.12	8.61	10.48	-
2	Corenco 5-3-5 Tobacco Grower	.	.	.	.	.	.16	.81	4.10	5.07	4.15	-	5.27
1	Corenco 5-8-7 General Crop Manure	.	.	.	.	.	3.88	.54	1.16	5.58	8.10	7.34	-
6	Corenco 5-8-7 General Crop Manure	.	.	.	.	.	3.26	.46	1.55	5.27	8.23	7.95	-
2	Corenco 5-8-7 General Crop Manure	.	.	.	.	.	3.74	.48	.85	5.07	8.10	6.74	-
6	Corenco 5-8-7 General Crop Manure	.	.	.	.	.	3.58	.62	1.02	5.22	8.93	7.25	-
4	Corenco 5-8-7 with Water Soluble Magnesium 1% (c)	.	.	.	.	.	3.26	1.02	.88	5.16	8.16	6.73	-

a The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

<sup>b</sup> Magnesium oxide guaranteed, 1%: found in composite of 2 samples, 1.45%; found in 1 sample, 1.30%; water soluble 1.18%. Magnesium oxide guaranteed, 1.67: found in composite of 4 samples, 1.50%. Magnesium oxide guaranteed, 1.50: found in composite of 4 samples, 1.50%.

*c* Magnesium oxide guaranteed, 1%: found in composite of 4 samples, 1.52%; water soluble 1%.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Consolidated Rendering Co. — Concluded.								
5	Corenco 5-8-10 Peerless Potato	3.50	.43	1.26	5.19	8.29	9.83	—
1	Corenco 5-8-10 Peerless Potato	3.48	.55	1.06	5.09	8.04	10.23	—
2	Corenco 5-9-8	2.15	1.16	1.93	5.24	9.31	8.08	—
1	Corenco 6-3-6 Special Tobacco Grower	.30	1.21	4.59	6.10	4.15	—	6.24
2	Corenco 7-3-7 Super Tobacco Grower.	.58	1.17	5.26	7.01	3.89	—	7.21
5	Corenco 7-6-6 Top Dressing	6.56	none	.69	7.25	6.25	6.01	—
4	Corenco 7-6-6 Top Dressing	6.64	.07	.75	7.46	6.63	5.86	—
2	Corenco 7-8-5 Complete Fruit	5.42	.88	.92	7.22	8.54	5.97	—
3	Corenco 7-13-11 "It Cuts the Cost"	4.92	1.21	1.06	7.19	13.52	11.32	—
2	Corenco 8-16-14 Two in One	6.06	1.29	1.00	8.35	17.02	14.03	—
2	Corenco 8-16-14 Two in One with Water Soluble Magnesium 2% (a)	6.94	.96	.35	8.25	16.14	13.88	.62
1	New England 8-6-2 Putting Green Special	5.36	.30	2.75	8.41	7.14	2.05	.57
1	New England 8-6-2 Putting Green Special (1933 stock)	4.76	.81	3.08	8.65	6.83	1.31	1.52
1	Springfield 5-5-5 Lawn and Shrub Fertilizer	2.46	.27	2.79	5.52	6.63	—	5.39
Davey Tree Expert Co.								
1	Davey Tree Food 10-3-3	5.98	1.68	2.32	9.98	3.76	1.89	1.19

## Eastern States Farmers' Exchange

2	Eastern States 0-14-6 (b)	.	.	.	.	.	.	.	.	14.41	6.24	-
5	Eastern States 4-8-8 (c)	.	.	.	.	.	.	.	.	8.55	6.16	3.06
5	Eastern States 4-8-8 (c)	.	.	.	.	.	.	.	.	8.93	8.50	8.88
2	Eastern States 4-8-8 (c)	.	.	.	.	.	.	.	.	8.87	3.82	4.42
2	Eastern States 4-10-6 (d)	.	.	.	.	.	.	.	.	10.97	6.61	-
1	Eastern States 4-10-6 (d)	.	.	.	.	.	.	.	.	11.35	6.80	-
1	Eastern States 4-10-6 (d)	.	.	.	.	.	.	.	.	10.53	1.56	4.99
6	Eastern States 4-12-4 (e)	.	.	.	.	.	.	.	.	12.88	4.11	.81
3	Eastern States 4-12-4 (e)	.	.	.	.	.	.	.	.	12.76	5.03	-
2	Eastern States 4-12-4 (e)	.	.	.	.	.	.	.	.	12.88	4.03	1.02
4	Eastern States 4-16-20 (f)	.	.	.	.	.	.	.	.	19.26	15.65	4.35
1	Eastern States 4-16-20 (f)	.	.	.	.	.	.	.	.	18.31	16.43	3.53
1	Eastern States 4-16-20 (f)	.	.	.	.	.	.	.	.	15.50	20.81	-
1	Eastern States 5-5-15 Tobacco (g)	.	.	.	.	.	.	.	.	5.23	-	15.54
1	Eastern States 6-3-6 Cranberry	.	.	.	.	.	.	.	.	4.01	-	5.81
1	Eastern States 6-3-6 Cranberry	.	.	.	.	.	.	.	.	5.99	-	7.12
6	Eastern States 6-8-6 (h)	.	.	.	.	.	.	.	.	8.74	3.41	3.18
3	Eastern States 6-8-6 (h)	.	.	.	.	.	.	.	.	8.42	1.64	4.64
2	Eastern States 6-8-6 (h)	.	.	.	.	.	.	.	.	8.92	2.55	3.48
2	Eastern States 6-15-9 (i)	.	.	.	.	.	.	.	.	15.30	8.05	1.68
1	Eastern States 6-15-9 (i)	.	.	.	.	.	.	.	.	15.75	4.93	4.49
1	Eastern States 8-4-8 Tobacco (j)	.	.	.	.	.	.	.	.	4.21	-	8.64
6	Eastern States 8-16-16 (k)	.	.	.	.	.	.	.	.	16.96	12.57	4.10
6	Eastern States 8-16-16 (k)	.	.	.	.	.	.	.	.	16.40	15.69	1.81
3	Eastern States 8-16-16 (k)	.	.	.	.	.	.	.	.	16.40	14.46	3.57

*a* Magnesium oxide guaranteed, 2%; found in composite of 2 samples, 2.17%; in water soluble form.

*b* Magnesium oxide guaranteed, 2.9%; found in composite of 2 samples, 3.26%; found in composite of 5 samples, 1.45%; found in composite of 2 samples, 1.09%.

*c* Magnesium oxide guaranteed, .8%; found in composite of 2 samples, 1.38%; found in composite of 5 samples, 1.30%; found in 1 sample, .8%; found in 1 sample, 1.09%.

*d* Magnesium oxide guaranteed, .8%; found in composite of 2 samples, 1.30%; found in composite of 3 samples, 1.59%; found in composite of 2 samples, 1.52%.

*e* Magnesium oxide guaranteed, 1.6%; found in composite of 4 samples, 1.88%; found in 1 sample, 1.74%; found in 1 sample, 2.03%.

*f* Magnesium oxide guaranteed, 2.78%; found in 1 sample, 3.62%.

*g* Magnesium oxide guaranteed, .8%; found in composite of 6 samples, 1.88%; found in composite of 3 samples, 1.96%; found in composite of 2 samples, 1.81%.

*h* Magnesium oxide guaranteed, 1.2%; found in composite of 2 samples, 1.45%; found in 1 sample, 1.38%.

*i* Magnesium oxide guaranteed, 1.56%; found in 1 sample, 1.59%.

*j* Magnesium oxide guaranteed, 1.6%; found in composite of 6 samples, 2.68%; found in composite of 3 samples, 2.90%; found in composite of 3 samples, 2.61%.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Eastern States Farmers' Exchange — Concluded.								
1	Eastern States 8-16-16 (Low Chlorine Special) (a)	6.00	1.93	.69	8.62	16.84	—	16.98
1	Eastern States 8-16-16 (Low Chlorine Special) (a)	5.90	.77	.29	6.96	16.45	5.75 b	14.43
3	Eastern States 8-24-8 (c)	5.26	2.66	.77	8.69	24.55	—	9.84
2	Eastern States 8-24-8 (c)	5.30	2.32	1.04	8.66	26.21	—	8.39
2	Eastern States 10-5-10 Tobacco (d)	2.92	3.03	4.72	10.67	5.10	—	10.89
1	Eastern States 10-5-10 Tobacco (d)	.50	2.77	7.31	10.58	5.61	—	11.52
2	Eastern States 12-4-4	7.86	4.26	.59	12.71	4.40	3.86	1.30
2	Eastern States 12-4-4	7.38	4.14	.74	12.26	5.30	2.63	2.04
2	Eastern States 12-16-12 (e)	7.12	3.84	1.73	12.69	17.29	—	12.40
2	Eastern States 12-16-12 (e)	6.62	3.61	1.81	12.04	16.71	—	12.56
Thomas W. Emerson Co.								
2	Emerson's English Formula Lawn and Garden Dressing 5-7-2	3.00	.16	2.55	5.71	9.57	1.31	1.93
2	Emerson's English Formula Lawn and Garden Dressing 5-7-2	2.94	.22	2.36	5.52	8.93	2.46	1.01
Excell Laboratories								
1	Zenke's New Plant Life (1933 stock) (1.4-1.07-.54)	.92	.97	—	1.89	.45	—	1.44
Fertilawn Co.								
1	Ferti-Lawn 4-7-3 (Blend of Lawn Seed and Lawn Fertilizer)	4.12	.05	2.29	6.46	5.87	5.35	—
H. L. Frost & Higgins Co.								
1	Frost's Lawn & Shrubbery Special 8-6-3	1.32	.73	5.59	7.64	6.12	2.88	.63
1	Frost's Shade Tree Special 10-6-6	6.16	.55	2.72	9.43	7.01	4.19	2.40

T. J. Grey Co.										
1	Grey's 9-6-6 Plant Food for Lawns, etc.	.	.	.	.	.	.	.	.	-
Thomas Hersom & Co.										
3	4-8-4 Neverfail	.	.	.	.	.	.	.	.	-
4	5-8-7 Neverfail	.	.	.	.	.	.	.	.	-
2	5-8-7 Neverfail	.	.	.	.	.	.	.	.	-
International Agricultural Corp.										
4	International 3-10-4	.	.	.	.	.	.	.	.	-
2	International 3-10-4	.	.	.	.	.	.	.	.	-
5	International 4-8-4	.	.	.	.	.	.	.	.	-
4	International 4-8-4	.	.	.	.	.	.	.	.	-
1	International 4-8-4	.	.	.	.	.	.	.	.	-
2	International 4-8-7	.	.	.	.	.	.	.	.	-
1	International 4-8-8	.	.	.	.	.	.	.	.	-
5	International 4-8-10	.	.	.	.	.	.	.	.	-
2	International 4-8-10	.	.	.	.	.	.	.	.	-
2	International 4-8-10	.	.	.	.	.	.	.	.	-
5	International 5-8-7	.	.	.	.	.	.	.	.	-
6	International 5-8-7	.	.	.	.	.	.	.	.	-
1	International 5-8-7	.	.	.	.	.	.	.	.	-
4	International 7-6-6	.	.	.	.	.	.	.	.	-
2	International 7-6-6	.	.	.	.	.	.	.	.	-
2	International 8-16-14 (f)	.	.	.	.	.	.	.	.	-
1	International 8-16-14 (f)	.	.	.	.	.	.	.	.	-
1	International 8-16-14 (f)	.	.	.	.	.	.	.	.	-
1	International 8-16-14 (f)	.	.	.	.	.	.	.	.	-
<sup>a</sup> Magnesium oxide guaranteed 1.6%; found in 1 sample, 2.90%; found in 1 sample, 2.90%. <sup>b</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash. <sup>c</sup> Magnesium oxide guaranteed, 1.6%; found in composite of 3 samples, 1.67%; found in composite of 2 samples, 2.39%. <sup>d</sup> Magnesium oxide guaranteed, 1.7%; found in composite of 2 samples, 1.86%; found in 1 sample, 1.96%. <sup>e</sup> Magnesium oxide guaranteed, 1.6%; found in composite of 2 samples, 1.74%; found in composite of 2 samples, 2.24%. <sup>f</sup> Magnesium oxide guaranteed, 1%; found in composite of 2 samples, 1.16%; found in 1 sample, 1.16%; found in 1 sample, 1.23%; found in 1 sample, 1.16%. One other sample was deficient: see analysis in table of "Mixtures showing a commercial shortage of \$1 or more per ton."										

6.92 1.09 .70 8.71 8.03 6.32

3.24 .55 .59 4.38 8.29 4.65

2.86 1.08 1.35 5.29 8.61 7.09

3.98 1.01 .81 5.80 8.23 7.05

2.38 .88 .31 3.57 10.07 4.01

2.52 .82 .39 3.73 9.31 4.03

2.96 .49 .70 4.15 8.29 3.76

3.18 .69 .52 4.39 8.41 3.91

3.18 .76 .59 4.53 8.10 4.65

3.36 .20 .52 4.08 8.03 7.15

3.48 .56 .37 4.41 8.36 8.14

3.46 .17 .42 4.05 8.10 9.89

3.80 .23 .21 4.24 8.29 10.35

3.26 .58 .60 4.44 8.16 10.78

4.00 .53 .55 5.08 8.10 7.71

4.04 .32 .67 5.03 8.54 7.33

3.72 .88 .60 5.20 7.65 7.04

5.82 .61 .71 7.14 6.32 5.24

5.38 1.23 .97 7.58 6.70 6.30

6.70 1.01 .69 8.40 16.14 11.83

6.98 1.01 .36 8.35 16.26 12.61

6.82 .65 .55 8.02 16.01 12.49

6.94 .83 .61 8.38 17.09 12.24



## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.			Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.		Total.	As Muriate.	In Forms Other than Muriate.
International Agricultural Corp. — Concluded								
3	International Caribbee Green & Fairway 7-5-3	2.54	.42	3.79	5.17	2.88	.68	
2	International Caribbee Green & Fairway 7-5-3	2.92	.38	3.94	5.48	2.56	—	
4	International Caribbee Peruvian Guano 13-10-2	3.28	.48	10.08	11.29	.94	1.56	
1	International Caribbee Peruvian Guano 13-10-2	3.06	.96	10.24	11.13	1.27	.90	
1	International Caribbee Tobacco Starter 5-8-16	.62	2.16	2.40	9.63	2.26a	13.25	
4	International Caribbee 5-10-10 (b)	1.10	1.53	2.53	10.21	1.64a	8.36	
4	International Caribbee 5-10-10 (b)	1.38	1.44	2.33	10.46	—	10.00	
1	International Caribbee 5-10-10 (1933 stock)	1.16	1.29	2.87	11.42	1.68a	7.54	
4	International Caribbee 7-12-10 (c)	2.20	2.25	2.52	12.05	1.56	8.46	
1	International Caribbee 7-12-10 (c)	2.34	2.15	2.44	12.18	1.64	8.01	
1	International Caribbee 10-16-20 (d)	4.28	4.11	1.81	16.08	6.49	11.77	
1	International Caribbee 10-16-20 (d)	4.36	3.24	2.62	16.78	6.65	12.35	
1	International Caribbee 10-16-20 (d)	4.10	3.42	2.13	16.39	5.34	13.97	
Little Tree Farms								
1	Little Tree Farm Plant Food 5-8-5	4.12	.24	1.44	14.29	5.27	—	
Lowell Fertilizer Co.								
3	Lowell 2-10-2 Bone Brand	1.86	none	1.14	9.63	2.54	—	
2	Lowell 2-10-2 Bone Brand	1.38	.10	.81	10.14	2.05	—	
3	Lowell 3-10-4 Animal Brand	2.60	.54	.52	9.57	4.55	—	
2	Lowell 3-10-4 Animal Brand	2.14	none	1.10	10.02	4.27	—	

8	Lowell 4-8-4 Corn and Vegetable.	.	.	.	.	.	.	.	2.94	.32	1.19	4.45	8.10	4.32
1	Lowell 4-8-4 Corn and Vegetable.	.	.	.	.	.	.	.	2.70	.41	.80	3.91	8.10	7.84
1	Lowell 4-8-4 Corn and Vegetable.	.	.	.	.	.	.	.	2.58	.39	1.05	4.02	8.16	3.88
4	Lowell 4-8-7 Old General Crop Manure	.	.	.	.	.	.	.	2.56	.37	1.16	4.09	8.48	7.83
2	Lowell 4-8-7 Old General Crop Manure	.	.	.	.	.	.	.	2.74	.90	.97	4.61	8.03	8.62
5	Lowell 4-8-10 Potato Grower	.	.	.	.	.	.	.	2.60	.39	1.08	4.07	8.36	10.02
3	Lowell 4-8-10 Potato Grower	.	.	.	.	.	.	.	3.26	.76	.51	4.53	8.36	10.70
6	Lowell 5-8-7 Market Garden Manure	.	.	.	.	.	.	.	3.60	.49	.93	5.02	8.29	7.05
2	Lowell 5-8-7 Market Garden Manure	.	.	.	.	.	.	.	4.00	.60	.72	5.32	8.16	7.37
1	Lowell 5-8-7 Market Garden Manure	.	.	.	.	.	.	.	3.88	.31	.90	5.09	8.35	6.97
2	Lowell 5-8-10 Aroostook Special for Potatoes	.	.	.	.	.	.	.	4.20	.31	.50	5.01	8.04	9.61
2	Lowell 5-8-10 Aroostook Special for Potatoes	.	.	.	.	.	.	.	3.78	.90	.91	5.59	8.36	10.19
5	Lowell 7-6-6 Top Dressing	.	.	.	.	.	.	.	6.44	none	.65	7.09	6.38	6.05
3	Lowell 7-6-6 Top Dressing	.	.	.	.	.	.	.	6.24	.64	.25	7.13	6.83	6.41
1	Lowell 7-8-5 Complete Fruit	.	.	.	.	.	.	.	5.06	.52	1.08	6.66	8.29	7.55
1	Lowell 7-8-5 Complete Fruit	.	.	.	.	.	.	.	5.18	.64	1.16	6.98	8.36	4.65
<b>Miller Fertilizer Co.</b>														
2	Lan-Fer Special 8-6-2	.	.	.	.	.	.	.	5.36	.44	1.72	7.52	8.61	3.34
1	Miller Harvest Brand 2-8-2	.	.	.	.	.	.	.	1.46	none	.79	2.25	9.18	3.19
1	Miller Harvest Brand 3-8-4	.	.	.	.	.	.	.	2.64	.21	.43	3.28	8.61	4.96
1	Miller Harvest Brand 4-6-10	.	.	.	.	.	.	.	3.56	.20	.39	4.15	6.82	9.58
3	Miller Harvest Brand 4-8-4	.	.	.	.	.	.	.	3.42	.27	.62	4.31	8.54	4.34
3	Miller Harvest Brand 4-8-4	.	.	.	.	.	.	.	3.32	none	.59	3.91	9.05	4.81
1	Miller Harvest Brand 4-8-7	.	.	.	.	.	.	.	3.04	none	.39	3.43	9.76	6.86
1	Miller Harvest Brand 4-8-10	.	.	.	.	.	.	.	3.70	.09	.50	4.29	9.29	10.39
4	Miller Harvest Brand 5-8-7	.	.	.	.	.	.	.	4.46	.14	.47	5.07	8.61	7.34
2	Miller Harvest Brand 5-8-7	.	.	.	.	.	.	.	4.38	.44	.41	5.23	8.36	7.13
1	Miller Harvest Brand 7-6-6	.	.	.	.	.	.	.	4.82	.34	.51	5.67	7.14	7.18

*a* The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

*b* Magnesium oxide guaranteed, 2%: found in composite of 4 samples, 3.08%; found in composite of 4 samples, 2.75%.

*c* Magnesium oxide guaranteed, 2%: found in composite of 4 samples, 2.03%; found in 1 sample, 2.24%.

*d* Magnesium oxide guaranteed, 2%: found in 1 sample, 2.03%; found in 1 sample, 2.46%; found in 1 sample, 2.03%. One other sample was deficient: see analysis in table of "Mixtures showing a commercial shortage of \$1 or more per ton."

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.			Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.		Total.	As Muriate.	In Forms Other than Muriate.
New England Fertilizer Co.								
1	New England 3-10-4 (old stock)	1.72	.28	1.45	10.40	4.34	—	
1	New England 4-8-7 (old stock)	3.00	.42	.69	8.04	6.74	—	
Old Deerfield Fertilizer Co., Inc.								
2	Old Deerfield Complete Tobacco 5-3-5	.36	.83	4.11	4.40	—	5.58	
1	Old Deerfield Complete Tobacco 5-3-5	.42	.64	4.14	3.00	—	5.46	
2	Old Deerfield Complete Tobacco 6-3-7	1.26	.31	4.74	3.44	—	7.34	
1	Old Deerfield Complete Tobacco 6-3-7	1.26	.47	4.50	3.32	—	7.58	
2	Old Deerfield Corn & Seeding Down 3-10-6	1.12	.69	1.53	11.16	4.93	1.45	
1	Old Deerfield General Crop 4-8-4	1.58	1.06	1.68	8.93	4.27	—	
2	Old Deerfield Grass Top Dressing 7-6-6	4.24	2.40	.84	6.12	6.00	.28	
1	Old Deerfield Grass Top Dressing 7-6-6	4.10	2.40	.81	6.63	6.59	—	
1	Old Deerfield Grass Top Dressing 7-6-6	4.28	2.42	.62	7.08	—	6.92	
1	Old Deerfield High Potash 4-8-10	1.60	.86	1.63	8.67	10.70	—	
2	Old Deerfield Lawnshrub 5-5-5	1.34	.19	4.04	7.72	5.48	—	
1	Old Deerfield Potato 8-16-14	3.82	.85	3.75	17.48	14.38	—	
3	Old Deerfield Potato Fertilizer 4-8-7	1.18	.92	2.14	9.12	7.11	—	
4	Old Deerfield Potato with Sulfate Potash 4-8-7	1.22	1.12	1.98	9.25	—	7.27	
2	Old Deerfield Set Onion 5-8-7	1.72	1.16	2.66	8.68	7.17	—	

2	Old Deerfield Set Onion with Sulfate Potash 5-8-7	2.18	.83	2.31	5.32	8.80	7.07
1	Old Deerfield Special Potato 4-6-10	1.38	1.60	1.16	4.14	6.95	—
1	Old Deerfield Special Potato 4-6-10	1.76	1.12	1.83	4.71	8.86	8.30
1	Old Deerfield Tobacco Starter 5-8-12	.50	1.51	3.52	5.53	8.67	12.56
2	Old Deerfield Tobacco Starter 5-8-12	.36	1.66	3.60	5.62	8.82	12.40
1	Old Deerfield 10-16-14 with Sulfate of Potash	3.48	1.99	4.95	10.42	15.56	15.88
3	Valley Brand General Crop 4-8-4	3.38	none	.86	4.24	8.42	4.28
1	Valley Brand General Crop 4-8-4	3.54	.08	.90	4.52	8.86	4.36
1	Valley Brand 4-8-4 with Sulfate of Potash	3.38	.15	1.03	4.56	8.29	4.40
1	Valley Brand Market Garden 4-8-7	3.62	none	.86	4.48	8.10	—
2	Valley Brand Onion Set 5-8-7	3.40	.36	1.73	5.49	8.16	—
2	Valley Brand Onion Set 5-8-7	3.52	.28	1.64	5.44	8.61	—
<b>Olds &amp; Whipple, Inc.</b>							
5	"Luxura" 5-8-6	2.70	.74	2.33	5.77	10.08	2.31
3	O & W Blue Label Tobacco Fertilizer 6-3-6	.68	.72	4.85	6.25	3.19	6.34
3	O & W Complete Tobacco Fertilizer 5-3-5	.30	.86	4.28	5.44	3.44	5.97
1	O & W High Grade Potato & Vegetable Fertilizer 5-8-7	3.40	.88	1.08	5.36	8.29	—
1	O & W High Grade Tobacco Starter & Potash Compound 5-4-15	.32	.98	3.90	5.20	3.82	15.93
2	O & W Market Garden Fertilizer 4-8-4	2.04	1.02	1.33	4.39	8.16	3.51
2	O & W Market Garden Fertilizer 4-8-4	2.12	1.42	1.75	4.29	8.04	.95
2	O & W Potato & General Purpose Fertilizer 4-8-7	2.06	1.44	1.18	4.68	8.03	—
2	O & W Top Dressing & Grass Fertilizer 8-6-6	3.24	4.31	.99	8.54	6.25	—
1	Wilcox Market Garden 4-8-4	2.30	1.15	.84	4.29	8.22	.58
1	Wilcox Potato & General Purpose 4-8-7	2.30	.80	1.13	4.23	8.04	—
1	Wilcox Potato & General Purpose 4-8-7	2.38	.79	1.07	4.24	8.48	—

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
<b>Pedigreed Seed Co., Inc.</b>								
1	Laguma Special Turf Fertilizer 5-8-6 . . . . .	4.00	.58	1.31	5.89	6.69	6.94	-
<b>F. G. Phillips Co.</b>								
3	Ferti-Flora 3-3-3 . . . . .	1.64	2.59	.04	4.27	3.95	-	3.91
<b>Plantabbs Corp.</b>								
1	Fulton's Plantabbs 11-15-20 . . . . .	3.42	7.80	.12	11.34	19.20	-	25.50
2	Fulton's Plantabbs 11-15-20 . . . . .	3.54	7.64	.04	11.22	19.01	-	25.54
<b>Arthur B. Porter, Inc.</b>								
3	Porter Special Golf Course Fertilizer 8-6-2 . . . . .	2.30	.63	5.56	8.49	6.89	2.52	-
2	Porter Special Golf Course Fertilizer 8-6-2 . . . . .	1.72	1.18	5.23	8.13	7.27	1.40	.60
<b>Rogers &amp; Hubbard Co.</b>								
2	Gro Fast 5-6-6 . . . . .	1.34	.25	3.46	5.05	5.17	6.88	-
1	Gro Fast 5-6-6 . . . . .	1.38	.45	3.50	5.33	5.36	1.19	5.48
5	Hubbard's All Soils All Crops Fertilizer 4-8-4 . . . . .	1.48	.88	1.76	4.12	8.29	4.32	-
1	Hubbard's All Soils All Crops Fertilizer 4-8-4 . . . . .	2.06	.89	1.17	4.12	8.29	4.34	-
6	Hubbard's "Bone Base" Oats & Top Dressing 8-5-8 . . . . .	.12	7.25	.65	8.02	8.23	1.77 <sup>a</sup>	6.95
2	Hubbard's "Bone Base" Oats & Top Dressing 8-5-8 . . . . .	.28	7.10	.98	8.36	6.88	2.34 <sup>a</sup>	6.03
2	Hubbard's "Bone Base" Oats & Top Dressing 8-5-8 . . . . .	.22	7.61	.70	8.53	7.71	1.81 <sup>a</sup>	6.68
2	Hubbard's "Bone Base" Seeding Down Fertilizer 3-7-6 . . . . .	1.52	.06	1.67	3.25	8.16	6.51	-

3	Hubbard's "Bone Base" Soluble Corn Manure 4-8-7	.67	1.19	4.78	8.67	7.05
2	Hubbard's "Bone Base" Soluble Corn Manure 4-8-7	1.13	1.23	4.66	9.05	7.64
2	Hubbard's "Bone Base" Soluble Potato Manure 5-8-7	1.18	1.83	5.13	8.10	5.09
1	Hubbard's "Bone Base" Soluble Potato Manure 5-8-7	1.40	2.18	4.94	8.04	3.20
3	Hubbard's "Bone Base" Soluble Tobacco Manure 5-8-10	1.15	2.37	5.62	8.68	1.93
1	Hubbard's "Bone Base" Soluble Tobacco Manure 5-8-10	1.96	1.67	5.05	9.51	6.31
2	Hubbard's "Bone Base" Tobacco Grower, Vegetable Formula 6-3-6	1.36	4.60	6.20	3.26	10.12
2	Hubbard's "Bone Base" Tobacco Grower, Vegetable Formula 6-3-6	1.13	4.73	6.08	2.75	10.62
2	Hubbard's Climax Tobacco Brand 5-3-5	1.69	3.09	5.16	3.51	6.67
6	Hubbard's Corn & Grain Fertilizer 2-12-4	none	.95	2.39	11.48	6.98
2	Hubbard's Corn & Grain Fertilizer 2-12-4	.40	1.09	2.59	11.87	5.89
1	Hubbard's Golf Course Fertilizer 8-6-2	.26	6.21	7.99	6.19	4.46
2	Hubbard's High Potash 2-8-10	.04	.58	2.22	8.03	4.30
7	Hubbard's Potato Fertilizer 5-8-7	.76	2.21	5.17	8.10	1.81
4	Hubbard's Potato Fertilizer 5-8-7	.84	1.87	5.23	8.48	10.66
1	Hubbard's Potato Fertilizer with Sulphate of Potash 5-8-7	.78	2.62	5.40	8.04	7.21
2	Hubbard's Tobacco Starter 5-4-15	3.51	1.59	5.24	3.57	7.62
2	Red H 4-6-10	.16	.53	4.61	6.25	7.52
6	Red H 4-8-4	none	1.00	4.18	8.49	17.12
5	Red H 4-8-4	.23	.93	4.28	8.74	10.08
2	Red H 4-8-4	.12	.87	4.31	8.87	4.34
4	Red H 4-8-7	none	.76	4.28	8.23	4.55
2	Red H 4-8-7	.08	.60	4.38	8.35	4.30
2	Red H 4-8-10	.13	.73	4.44	8.10	7.77
7	Red H 5-8-7	none	1.17	5.23	8.17	7.67
3	Red H 5-8-7	.23	1.30	5.09	8.22	10.70

<sup>a</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

## Mixtures Substantially Complying with Guarantees — Continued.

Num-ber of Sam-ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Rogers & Hubbard Co. — Concluded.								
5	Red H 7-6-6	6.30	none	.82	7.12	6.50	6.59	—
2	Red H 7-6-6	6.24	.24	.64	7.12	6.63	6.65	—
1	Red H 7-6-6	6.02	.37	.48	6.87	6.88	6.28	—
4	Red H 8-16-14	7.22	none	1.16	8.38	17.09	14.34	—
1	Red H 8-16-14	7.52	none	.67	8.19	16.07	—	14.65
F. S. Royster Guano Co.								
2	Royster Connecticut Tobacco Guano 5-3-5	.22	1.01	4.26	5.49	3.31	—	5.11
1	Royster 5% Truck Guano 5-8-7	4.08	.74	1.12	5.94	8.03	7.02	—
2	Royster Truckers Delight 4-8-4	3.40	.64	.79	4.83	8.54	4.01	—
Salem Chemical & Supply Co.								
1	Plant Food (Liquid) 3-4-3	3.28	.15	.10	3.53	4.21	3.10	—
2	Plant Food (Liquid) 3-4-3	3.12	.15	—	3.27	4.21	3.16	—
O. M. Scott & Sons Co.								
1	Scott's Turf Builder 10-6-4	4.32	.31	5.62	10.25	6.19	2.83	1.28
M. L. Shoemaker & Co., Inc.								
2	Shoemaker's "Swift-Sure" 4-10-0	2.46	.30	1.32	4.08	11.22	—	—
Smith Agricultural Chemical Co.								
1	Sacco Plant Food 4-12-4	3.82	.73	.14	4.69	12.24	3.53	1.26

Standard Wholesale Phosphate & Acid Works, Inc.													
1	Standard United States 2 x 12 x 2	.	.	.	.	.	1.56	none	.79	2.35	11.61	2.07	—
1	Standard United States 4 x 8 x 4	.	.	.	.	.	3.40	none	.70	4.10	8.74	4.15	—
1	Standard United States 4 x 8 x 4	.	.	.	.	.	3.18	.12	.77	4.07	8.80	4.46	—
1	Standard United States 4 x 8 x 4	.	.	.	.	.	3.26	.06	.77 <sup>a</sup>	4.09	8.23	4.40	—
1	Standard United States 5 x 8 x 7	.	.	.	.	.	3.86	none	1.33	5.19	8.80	6.82	—
Stimulant Laboratories, Inc.													
1	Stimulant 11-12-15 Tablets	.	.	.	.	.	2.74	8.76	.10	11.60	15.31	—	19.70
1	Stimulant 11-12-15 Tablets	.	.	.	.	.	2.48	8.14	—	10.62	14.35	—	17.54
Swift & Co. Fertilizer Works													
1	Swift's Special Golf Fertilizer 12-6-4	.	.	.	.	.	10.72	.58	.28	11.58	9.32	5.96	—
4	Vigoro 4-12-4	.	.	.	.	.	3.26	.50	.55	4.31	12.44	4.34	—
2	Vigoro 4-12-4	.	.	.	.	.	3.40	.33	.38	4.11	12.57	4.61	—
F. Sylvestre & Son													
1	Dove Brand Fertilizer 4-6-3	.	.	.	.	.	3.12	.16	2.42	5.70	8.10	1.31	2.41
Synthetic Nitrogen Products Corp.													
2	Nitrophoska 15-30-15	.	.	.	.	.	12.02	2.51	.69	15.22	30.36	15.04	—
1	Nitrophoska 15-30-15	.	.	.	.	.	12.34	2.24	.44	15.02	29.72	14.72	—
Tennessee Corp.													
3	Loma (5-10-4)	.	.	.	.	.	4.08	.76	.45	5.29	10.65	4.01	—
1	Loma (5-10-4)	.	.	.	.	.	3.84	.65	.71	5.20	10.78	4.03	—
5	Soil-Prep (4-2-2)	.	.	.	.	.	2.18	.14	1.99 <sup>a</sup>	4.31	2.04	1.89	.63
2	Soil-Prep (4-2-2)	.	.	.	.	.	1.66	.26	2.26 <sup>a</sup>	4.18	2.49	1.73	.54
Wm. Thompson & Sons, Ltd.													
1	Thompson's Special Top Dressing Manure (old stock) (4-7-2.5)	.	.	.	.	.	3.10	.27	1.43	4.80	10.39	—	4.96
Van Horne Chemical Co., Inc.													
1	Van Horne's Lawn & Garden Grower 5-8-5	.	.	.	.	.	1.60	.11	3.71	5.42	8.93	3.86	.33

<sup>a</sup> The water insoluble nitrogen was of inferior quality.



## Mixtures Substantially Complying with Guarantees — Concluded.

Num-ber of Sam- ples.	NAME OF MANUFACTURER, BRAND, AND GRADE.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Victory Fertilizer Corp.								
2	Victory Lawn & Garden Fertilizer 4-8-4	2.94	.11	.95	4.00	8.68	4.84	-
1	Victory Lawn & Garden Fertilizer 4-8-4	2.18	none	2.56	4.74	11.36	6.21	-
1	Victory Plant Food 3-8-4	3.24	.49	1.47	5.20	11.23	6.23	-
3	Victory Putting Green Fertilizer 6-8-2	4.88	.28	1.12	6.28	7.65	2.36	-
Virginia-Carolina Chemical Corp.								
1	BloomAid (New Process) 4-10-3	2.26	.22	2.18 <sup>a</sup>	4.66	11.36	2.87	1.67
1	BloomAid (1932 stock) (4.94-10-3)	4.06	.16	.84	5.06	10.21	4.58	-
4	V-C Fairway Fertilizer (New Process) 6-6-4	4.36	.82	1.13 <sup>a</sup>	6.31	6.44	2.63	1.83
2	V-C Fairway Fertilizer (New Process) 6-6-4	4.62	.40	1.70	6.72	6.63	1.23	2.96
Vita-Liza Co.								
1	Vita-Liza 4-3-2 (b)	.24	.09	3.55 <sup>a</sup>	3.88	2.17	-	3.52
1	Vita-Liza 4-3-2 (b)	1.70	.29	3.37	5.36	1.73	-	2.33
1	Vita-Liza B 4-2-1	.18	.08	3.63 <sup>a</sup>	3.89	1.72	-	1.59
C. P. Washburn Co.								
3	"Made Right" Corn & Vegetable 4-8-4	2.78	1.22	.22	4.22	8.61	4.01	-
2	"Made Right" Market Garden 5-8-7	3.82	.71	.57	5.10	8.54	6.59	-
1	"Made Right" Market Garden 5-8-7	4.48	none	1.11	5.59	7.72	7.36	-
1	"Made Right" Special Potato 4-8-10	2.80	.60	.69	4.09	8.16	10.39	-
Winslow Nurseries								
1	Green Valley Plant Food 5-10-7	1.10	.95	3.30	5.35	10.59	6.57	1.66

<sup>a</sup> The water insoluble nitrogen was of inferior quality.<sup>b</sup> Two other samples were deficient: see analysis in table of "Mixtures showing a commercial shortage of \$1 or more per ton."

## CHEMICALS AND RAW PRODUCTS

## Summary of Results of the Inspection of Fertilizer Samples and Raw Products

MATERIAL.	Number of Samples Collected.	Number of Analyses Made.	Average Percentage of Nitrogen.	Average Percentage of Total Phosphoric Acid.	Average Percentage of Available Phosphoric Acid.	Average Percentage of Water Soluble Potash.	Average Selling Price Per Ton.	Average Commercial Valuation per Ton.	Cost of One Pound of Plant Food (Cents).
Nitrate of soda . . .	48	14	16.17	—	—	—	\$43.30	\$33.15	13.4 (nitrogen)
Nitrate of potash . . .	7	7	13.20	—	—	44.58	67.74	61.83	12.5 (nitrogen) 3.9 (potash)
Nitrate of lime . . .	3	2	14.77	—	—	—	—	30.28	—
Cal-Nitro . . .	12	4	20.88	—	—	—	35.23	37.06	8.44 (nitrogen)
Nitrate of soda-potash . . .	5	2	14.40	—	—	15.10	53.33	41.30	14.43 (nitrogen) 3.90 (potash)
Ammonium sulfate . . .	52	16	20.82	—	—	—	38.26	31.23	9.19 (nitrogen)
Calurea . . .	2	2	34.04	—	—	—	90.00	66.09	14.98 (nitrogen)
Synthetic urea . . .	6	4	46.46	—	—	—	103.15	102.21	11.10 (nitrogen)
Cyanamid . . .	10	3	22.14 <sup>d</sup>	—	—	—	39.27	34.54	8.87 (nitrogen)
Ammo-Phos A . . .	3	3	11.33	49.11	48.32	—	62.63	63.22	7.5 (nitrogen) 4.69 (available phosphoric acid)
Ammo-Phos B . . .	1	1	16.76	21.30	20.73	—	—	45.06	—
Cottonseed meal . . .	28	28	6.70	2.10	—	1.86 <sup>b</sup>	31.48	31.83	23.5 (nitrogen)
Castor pomace . . .	10	10	5.49	1.02	—	1.15 <sup>b</sup>	27.30	26.08	24.9 (nitrogen)
Dried blood . . .	8	6	11.61	3.08	—	—	74.54	43.57	30.8 (nitrogen)
Milorganite . . .	5	2	6.17	2.81	—	—	26.72	23.99	19.7 (nitrogen)
Superphosphate 16% . . .	87	23	—	17.42	16.89	—	19.27	16.26	5.6 (available phosphoric acid)
Superphosphate 20% . . .	1	1	—	21.05	20.79	—	24.00	19.85	5.8 (available phosphoric acid)
Double superphosphate . . .	3	2	—	33.14	32.82	—	32.52	31.31	4.93 (available phosphoric acid)
Basic slag phosphate . . .	5	2	—	17.86	14.73	—	24.15	15.24	7.8 (available phosphoric acid)
Precipitated bone . . .	3	3	—	43.32	42.13	—	40.07	40.50	4.7 (available phosphoric acid)
Muriate of potash . . .	44	17	—	—	—	51.84	54.10	40.44	5.22 (potash)
High grade sulfate of potash . . .	13	6	—	—	—	48.89 <sup>c</sup>	60.42	46.93	6.18 (potash)
Potash-magnesia sulfate . . .	2	2	—	—	—	28.48 <sup>d</sup>	33.32	27.34	5.85 (potash)
Dry ground fish . . .	18	16	9.64	7.31 <sup>e</sup>	—	—	51.60	47.43	23.2 (nitrogen) 4.75 (phosphoric acid)
Animal tankage . . .	39	14	9.06	9.86 <sup>f</sup>	—	—	54.39	40.18	25.13 (nitrogen) 4.5 (phosphoric acid)
Ground bone . . .	98	39	2.85	24.44 <sup>g</sup>	—	—	46.06	32.86	—
Ground tobacco stems . . .	1	1	2.28	.45 <sup>h</sup>	—	4.39 <sup>b</sup>	—	14.72	—
Cotton hull ashes . . .	3	3	—	2.34 <sup>i</sup>	—	36.68	56.69	51.51	6.75 (potash)
Wood ashes . . .	5	5	—	1.82 <sup>j</sup>	—	6.01	43.04	14.92	—
Pulverized sheep manure (k) . . .	48	20	1.68	1.37	—	3.22 <sup>b</sup>	49.03	8.44	—
Pulverized sheep and goat manure (k) . . .	21	7	1.34	1.13	—	2.85 <sup>b</sup>	38.41	6.99	—
Pulverized cattle manure (k) . . .	23	7	2.05	1.54	—	1.91 <sup>b</sup>	48.12	8.58	—
Pulverized poultry manure (k) . . .	8	2	4.76	2.72	—	1.32 <sup>b</sup>	55.65	16.70	—
Pulverized poultry manure and peat (k) . . .	4	3	3.09	3.15	—	1.59 <sup>b</sup>	44.50	12.60	—
Sheep manure and wool waste (k) . . .	3	2	1.68	.52	—	5.19 <sup>b</sup>	16.80	9.29	—

<sup>a</sup> Also contains about 50% of calcium oxide in suitable form to neutralize soil acidity.

<sup>b</sup> Total potash.

<sup>c</sup> Chlorine 1.40%.

<sup>d</sup> Magnesium oxide 11.39%, chlorine 1.85%.

<sup>e</sup> Chlorine .22%.

<sup>f</sup> Average tankage finer than 1/50 inch, 48.67%; coarser than 1/50 inch, 51.33%.

<sup>g</sup> Average bone finer than 1/50 inch, 65.28%; coarser than 1/50 inch, 34.72%.

<sup>h</sup> Organic matter 68.70%.

<sup>i</sup> Total potash 38.16%, calcium oxide 8.26%, magnesium oxide 3.85%, chlorine 3.90%, insoluble matter 7.56%.

<sup>j</sup> Average calcium oxide 33.63%, magnesium oxide 3.94%, total potash 6.54%, water 9.54%, insoluble matter 8.08%.

<sup>k</sup> Average organic matter: sheep manure, 41.76%; sheep and goat manure, 28.25%; cattle manure, 72.67%; poultry manure, 66.42%; poultry manure and peat, 67.72%; sheep manure and wool waste, 35.86%.

### Nitrogen Compounds.

The chemicals and unmixed materials under this heading are valued chiefly for the nitrogen which they contain. Some of them, however, contain more than this one element; the nitrate of potash containing potash; the calcium nitrate and cyanamid containing lime; and the organic vegetable substances containing small quantities of phosphoric acid and potash, as will be noticed by a reference to the summary table on the previous page.

Brands showing a commercial shortage of one dollar or more per ton are listed by themselves, serious deficiencies being emphasized by boldface type.

#### Nitrate of Soda and Sulfate of Ammonia.

MANUFACTURER.	NITRATE OF SODA.			SULFATE OF AMMONIA.		
	Number of Samples.	NITROGEN.		Number of Samples.	NITROGEN.	
		Found.	Guaranteed.		Found.	Guaranteed.
American Agricultural Chemical Co.	$\left\{ \begin{array}{l} 1 \\ 14 \\ 1 \\ 2 \end{array} \right.$	$\left\{ \begin{array}{l} 16.04 \\ 16.24 \\ 16.20 \\ 15.78 \end{array} \right.$	$\left\{ \begin{array}{l} 16.00 \\ 16.00 \\ 16.00 \\ 15.25 \end{array} \right.$	$\left\{ \begin{array}{l} 1 \\ 12 \\ 2 \\ - \end{array} \right.$	$\left\{ \begin{array}{l} 20.90 \\ 20.92 \\ 20.98 \\ - \end{array} \right.$	$\left\{ \begin{array}{l} 20.50 \\ 20.50 \\ 20.56 \\ - \end{array} \right.$
Apothecaries Hall Co. . . . .	-	-	-	1	20.66	20.50
Armour Fertilizer Works . . . .	-	-	-	1	20.60	20.56
Barrett Co. . . . .	$\left\{ \begin{array}{l} 8a \\ 2a \\ 6a \end{array} \right.$	$\left\{ \begin{array}{l} 16.24 \\ 16.44 \\ 16.06 \end{array} \right.$	$\left\{ \begin{array}{l} 16.00 \\ 16.00 \\ 16.00 \end{array} \right.$	$\left\{ \begin{array}{l} 4a \\ 4a \\ 1a \end{array} \right.$	$\left\{ \begin{array}{l} 20.84 \\ 21.04 \\ 20.96 \end{array} \right.$	$\left\{ \begin{array}{l} 20.56 \\ 20.56 \\ 20.56 \end{array} \right.$
Chilean Nitrate Sales Corp. . . .	$\left\{ \begin{array}{l} 1b \\ 4b \\ 1c \\ 2b \\ 3d \end{array} \right.$	$\left\{ \begin{array}{l} 16.08 \\ 16.18 \\ 16.20 \\ 16.26 \\ 15.76 \end{array} \right.$	$\left\{ \begin{array}{l} 16.00 \\ 16.00 \\ 16.00 \\ 16.00 \\ 15.25 \end{array} \right.$	$\left\{ \begin{array}{l} - \\ - \\ - \\ - \\ - \end{array} \right.$	$\left\{ \begin{array}{l} - \\ - \\ - \\ - \\ - \end{array} \right.$	$\left\{ \begin{array}{l} - \\ - \\ - \\ - \\ - \end{array} \right.$
Consolidated Rendering Co. . . .	-	-	-	$\left\{ \begin{array}{l} 5 \\ 4 \\ - \end{array} \right.$	$\left\{ \begin{array}{l} 20.70 \\ 20.70 \\ - \end{array} \right.$	$\left\{ \begin{array}{l} 20.50 \\ 20.50 \\ - \end{array} \right.$
Eastern States Farmers' Exchange	-	-	-	$\left\{ \begin{array}{l} 3 \\ 3 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} 20.56 \\ 20.84 \\ 20.84 \end{array} \right.$	$\left\{ \begin{array}{l} 20.50 \\ 20.50 \\ 20.50 \end{array} \right.$
Ford Motor Co. . . . .	-	-	-	2	21.00	20.80
International Agricultural Corp. .	-	-	-	4	20.72	20.56
Koppers Products Co. . . . .	-	-	-	1e	20.84	20.75
Merrimac Chemical Co. . . . .	$\left\{ \begin{array}{l} 2 \\ 1 \end{array} \right.$	$\left\{ \begin{array}{l} 16.26 \\ 16.26 \end{array} \right.$	$\left\{ \begin{array}{l} 16.25 \\ 16.25 \end{array} \right.$	$\left\{ \begin{array}{l} - \\ - \end{array} \right.$	$\left\{ \begin{array}{l} - \\ - \end{array} \right.$	$\left\{ \begin{array}{l} - \\ - \end{array} \right.$
Rogers & Hubbard Co. . . . .	-	-	-	4	21.00	20.50

a Arcadian brand.

b Champion brand.

c Champion brand, 1933 stock.

d Standard brand.

e 1933 stock.

#### Nitrate of Potash.

MANUFACTURER.	Number of Samples.	NITROGEN.		POTASSIUM OXIDE.		Chlorine.
		Found.	Guaranteed.	Found.	Guaranteed.	
Berkshire Chemical Co. . . . .	1	13.46	13.00	44.12	44.00	.62
Consolidated Rendering Co. . . .	1	13.28	13.00	43.88	44.00	trace
Eastern States Farmers' Exchange .	$\left\{ \begin{array}{l} 1 \\ 1 \end{array} \right.$	$\left\{ \begin{array}{l} 13.10 \\ 13.20 \end{array} \right.$	$\left\{ \begin{array}{l} 13.00 \\ 13.00 \end{array} \right.$	$\left\{ \begin{array}{l} 43.60 \\ 43.76 \end{array} \right.$	$\left\{ \begin{array}{l} 44.00 \\ 44.00 \end{array} \right.$	$\left\{ \begin{array}{l} \text{trace} \\ \text{trace} \end{array} \right.$
International Agricultural Corp. (a)	$\left\{ \begin{array}{l} 3 \\ 2 \end{array} \right.$	$\left\{ \begin{array}{l} 14.38 \\ 14.82 \end{array} \right.$	$\left\{ \begin{array}{l} 14.00 \\ 14.00 \end{array} \right.$	$\left\{ \begin{array}{l} 15.12 \\ 14.66 \end{array} \right.$	$\left\{ \begin{array}{l} 15.00 \\ 15.00 \end{array} \right.$	$\left\{ \begin{array}{l} .25 \\ .22 \end{array} \right.$
Old Deerfield Fertilizer Co., Inc. .	$\left\{ \begin{array}{l} 1 \\ 1 \\ 1 \end{array} \right.$	$\left\{ \begin{array}{l} 13.16 \\ 13.48 \\ 13.10 \end{array} \right.$	$\left\{ \begin{array}{l} 13.00 \\ 13.00 \\ 13.00 \end{array} \right.$	$\left\{ \begin{array}{l} 45.58 \\ 44.78 \\ 43.84 \end{array} \right.$	$\left\{ \begin{array}{l} 44.00 \\ 44.00 \\ 44.00 \end{array} \right.$	$\left\{ \begin{array}{l} 1.06 \\ 1.10 \\ 1.26 \end{array} \right.$

a Nitrate of soda-potash.

## Calcium Nitrate, Cal-Nitro, Calurea, Urea and Calcium Cyanamid.

MANUFACTURER.	BRAND.	Number of Samples.	NITROGEN.	
			Found.	Guaranteed.
American Cyanamid Co. . . . .	Aero Cyanamid . . . . .	1	22.10	22.00
	Aero Cyanamid . . . . .	5	22.10	22.00
	Aero Cyanamid . . . . .	4	22.26	22.00
Foodndrink Co. . . . .	Foodndrink (a) . . . . .	1	16.14	13.00
Eastern States Farmers' Exchange . . . . .	Cal-Nitro . . . . .	1	21.06	20.50
	Cal-Nitro . . . . .	5	20.78	20.50
	Cal-Nitro . . . . .	5	21.08	20.50
Old Deerfield Fertilizer Co., Inc. . . . .	Urea . . . . .	1	46.28	46.00
	Urea . . . . .	1	46.04	46.00
	Urea . . . . .	1	46.58	46.00
Synthetic Nitrogen Products Corp. . . . .	Calcium Nitrate . . . . .	1	14.96	15.00
	Calcium Nitrate . . . . .	2	14.76	15.00
	Cal-Nitro . . . . .	1	16.56	16.00
	Calurea . . . . .	1	34.00	34.00
	Calurea . . . . .	1	34.08	34.00
	Urea . . . . .	3	46.42	46.00

a Urea in cartridge form for hose attachment.

## Cottonseed Meal and Castor Pomace.

MANUFACTURER.	COTTONSEED MEAL.			CASTOR POMACE.		
	Number of Analyses.	NITROGEN.		Number of Analysis.	NITROGEN.	
		Found.	Guaranteed.		Found.	Guaranteed.
American Agricultural Chemical Co. . . . .	—	—	—	1	5.64	4.53
Armour Fertilizer Works . . . . .	—	—	—	1	5.74	4.52
Ashcraft-Wilkinson Co. . . . .	10	6.71	6.56	—	—	—
Baker Castor Oil Co. . . . .	—	—	—	1	6.01	4.52
Berkshire Chemical Co. . . . .	—	—	—	2	5.01	4.52
Consolidated Rendering Co. . . . .	1	6.58	6.50	2	5.10	4.52
Humphreys-Godwin Co. . . . .	14	6.70	6.56	—	—	—
	1	6.89	6.88	—	—	—
International Agricultural Corp. . . . .	—	—	—	2	5.42	4.53
Maurice Pincoffs Co. . . . .	1	6.76	6.56	—	—	—
Old Deerfield Fertilizer Co., Inc. . . . .	—	—	—	1	4.79	4.52
Planters Manufacturing Co. . . . .	1	6.62	6.56	—	—	—

## Dried Blood and Milorganite.

MANUFACTURER.	BRAND.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.	
			Found.	Guaranteed.	Found.	Guaranteed.
Consolidated Rendering Co..	Dried Blood .	1	10.75	9.87	3.70	—
	Dried Blood .	1	9.95	9.87	7.53	—
New England Dressed Meat & Wool Co.	Dried Blood .	1	13.02	11.93	.64	—
Milwaukee Sewerage Commission	Milorganite .	4	6.18	6.00	2.81	2.75
	Milorganite (a)	1	5.76	5.00	2.93	2.75
New England Rendering Co..	Brighton Dried Blood .	1	11.16	11.51	3.95	—
	Brighton Dried Blood .	2	11.72	11.51	3.44	—

## Brand Showing Commercial Shortage of More than \$1 Per Ton.

John Reardon & Sons Co. .	Dried Blood .	2b	11.26	12.34	2.17	—
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a 1933 stock.

b Commercial shortage per ton, \$1.72.

## Commercial Peat Products.

MANUFACTURER AND BRAND.	Number of Samples.	Water.	Organic Matter.	Mineral Matter.	NITROGEN.	
					Found.	Guaranteed.
Atkins & Durbrow, Inc.						
Ground Peat Moss . . . . .	2a	16.10	81.80	2.10	.87	.24
Sorbex . . . . .	4a	14.65	83.63	1.72	.82	.24
Brague, Inc.						
Hinsdale Leafmold . . . . .	1b	5.55	93.13	1.72	1.41	.50
C. E. Buell, Inc.						
Buell-Boston Ground Peat . . . . .	1a	14.50	83.23	2.27	.94	.75
Curley Brothers						
Crystal Peat Moss . . . . .	1b	66.58	31.50	1.92	.65	.50
Florida Humus Co.						
Florida Humus . . . . .	1b	11.88	81.21	6.91	2.91	2.18
Florida Humus . . . . .	2b	27.80	68.70	3.50	2.46	2.18
Florida Humus . . . . .	2b	30.05	63.35	6.60	2.44	2.18
Maplevale Leafmold Co.						
Maplevale Leafmold . . . . .	2b	50.93	37.67	11.40	1.13	.25
Mrs. James A. Smith						
Ma-Ches-Ok Leafmold Peat . . . . .	1b	51.33	44.94	3.73	1.03	1.00
Victory Fertilizer Corp.						
Victory Humus . . . . .	1b	56.88	21.95	21.17	.76	.50

a Imported product.

b Domestic product.

**Phosphoric Acid Compounds.****Superphosphate, Precipitated Bone, and Basic Slag Phosphate.**

MANUFACTURER AND BRAND.	Number of Samples.	Total Phosphoric Acid.	AVAILABLE PHOSPHORIC ACID.	
			Found.	Guaranteed.
<b>Acme Guano Co.</b>				
Acme 16% Superphosphate . . . . .	1	16.33	15.95	16.00
<b>American Agricultural Chemical Co.</b>				
AA 16% Superphosphate . . . . .	1	17.40	17.06	16.00
AA 16% Superphosphate . . . . .	14	17.48	17.20	16.00
AA 16% Superphosphate . . . . .	7	17.09	16.58	16.00
Co-Op 16% Superphosphate . . . . .	4	17.80	17.23	16.00
Co-Op 16% Superphosphate . . . . .	3	16.97	16.20	16.00
<b>Apothecaries Hall Co.</b>				
Superphosphate 16% . . . . .	1	17.22	16.58	16.00
Superphosphate 32% . . . . .	1	34.18	33.41	32.00
Precipitated Bone . . . . .	1	41.20	39.80	38.00
<b>Armour Fertilizer Works</b>				
Big Crop 16% Superphosphate . . . . .	4	17.09	16.26	16.00
Big Crop 16% Superphosphate . . . . .	2	17.48	16.78	16.00
<b>Berkshire Chemical Co.</b>				
Berkshire Superphosphate 16% . . . . .	3	17.09	16.64	16.00
Berkshire Superphosphate 16% . . . . .	2	16.84	16.78	16.00
<b>Consolidated Rendering Co.</b>				
Superphosphate 16% . . . . .	6	16.33	16.27	16.00
Superphosphate 16% . . . . .	2	17.54	17.41	16.00
<b>Eastern States Farmers' Exchange</b>				
Eastern States 16% Superphosphate . . . . .	9	17.35	16.52	16.00
Eastern States 16% Superphosphate . . . . .	7	17.73	16.96	16.00
Eastern States 32% Superphosphate . . . . .	2	32.40	32.40	32.00
Precipitated Bone . . . . .	1	43.38	42.17	38.00
Precipitated Bone . . . . .	1	43.62	42.70	38.00
<b>International Agricultural Corp.</b>				
International 16% Superphosphate . . . . .	6	17.09	16.07	16.00
International 16% Superphosphate . . . . .	3	17.86	16.84	16.00
Genuine Imported Basic Slag . . . . .	3	17.86	14.61	14.40
Genuine Imported Basic Slag . . . . .	2	17.86	15.12	14.40
<b>Miller Fertilizer Co.</b>				
Harvest Brand 16% Superphosphate . . . . .	2	16.97	16.40	16.00
Harvest Brand 16% Superphosphate . . . . .	1	16.71	16.26	16.00
Harvest Brand 20% Superphosphate . . . . .	1	21.05	20.79	20.00
<b>Old Deerfield Fertilizer Co., Inc.</b>				
Old Deerfield 16% Superphosphate . . . . .	1	17.86	17.22	16.00
<b>Rogers and Hubbard Co.</b>				
Hubbard's 16% Superphosphate . . . . .	6	16.71	16.45	16.00
<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b>				
Standard United States 16% Superphosphate . . . . .	1	17.86	17.48	16.00
<b>C. P. Washburn Co.</b>				
Superphosphate 16% . . . . .	1	17.86	17.03	16.00

**Potash Compounds.****Sulfate of Potash-Magnesia.**

MANUFACTURER.	Number of Samples.	POTASH.		Magnesium Oxide	Chlorine.
		Found.	Guaranteed.		
N. V. Potash Export My., Inc. . . . .	1	25.84	25.00	7.11	1.90
	1	29.27	25.00	12.68	1.83

## Muriate and High Grade Sulfate of Potash.

MANUFACTURER.	MURIATE OF POTASH.			HIGH GRADE SULFATE OF POTASH.			
	Number of Samples.	POTASH.		Number of Samples.	POTASH.		Chlorine.
		Found.	Guaranteed.		Found.	Guaranteed.	
Acme Guano Co. . . . .	1	50.24	48.00	—	—	—	—
American Agricultural Chemical Co. . . . .	1	50.24	50.00	2	48.52	48.00	1.39
	3	51.24	50.00	—	—	—	—
	13	50.92	50.00	—	—	—	—
Armour Fertilizer Works . . . .	1	51.94	50.00	—	—	—	—
Berkshire Chemical Co. . . . .	1	42.84	43.00	—	—	—	—
Consolidated Rendering Co. . . .	3	54.28	50.00	—	—	—	—
	2	49.36	50.00	—	—	—	—
	1	61.40	60.00	—	—	—	—
	1	60.00	60.00	—	—	—	—
Eastern States Farmers' Exchange . . . . .	5	61.68	60.00	2	49.48	48.00	1.39
	1	62.32	60.00	—	—	—	—
	1	61.60	60.00	—	—	—	—
N. V. Potash Export My., Inc. . . .	1	50.32	48.00	1	49.12	48.00	1.25
	5	50.72	48.00	2	49.08	48.00	1.20
	3	50.96	48.00	3	49.68	48.00	2.03
	1	51.56	48.00 <sup>a</sup>	3	49.20	48.00 <sup>b</sup>	1.09

<sup>a</sup> Tagged 80% muriate, which would be equivalent to 50.54% potash.

<sup>b</sup> Tagged 90% sulfate, which would be equivalent to 48.64% potash.

## Products Supplying Nitrogen and Phosphoric Acid.

## Ammono-Phos.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		
		Found.	Guaranteed.	Total.	AVAILABLE.	
					Found.	Guaranteed.
American Cyanamid Co. . . . .	1	11.10	11.00	49.96	48.38	48.00
	1	10.92	11.00	49.62	48.66	48.00
	1	11.52	11.00	48.86	48.16	48.00
	1	16.76	16.00	21.30	20.73	20.00

## Dry Ground Fish.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		Chlorine
		Found.	Guaran- teed.	Found.	Guaran- teed.	
American Agricultural Chemical Co	1	9.44	9.00	7.27	6.00	trace
	1	9.79	9.00	7.40	6.00	.07
Apothecaries Hall Co. . . . .	1	9.30	9.46	7.91	6.00	trace
Berkshire Chemical Co. . . . .	3	9.64	9.45	6.51	6.00	.25
	1	9.51	9.45	6.76	6.00	.49
Consolidated Rendering Co. . . . .	1	8.84	9.46	10.20	6.00	.12
	1	10.12	9.46	8.16	6.00	trace
Eastern States Farmers' Exchange	1	10.06	9.00	5.61	6.00	.49
	1	10.04	9.00	5.68	6.00	.15
Old Deerfield Fertilizer Co., Inc. . .	1	9.10	9.05	8.29	5.00	.35
	1	9.38	9.05	8.29	5.00	trace
Olds & Whipple, Inc. . . . .	1	9.80	9.00	7.65	5.00	trace
	1	9.71	9.00	7.91	5.00	.74
Rogers & Hubbard Co. . . . .	1	8.98	9.00	6.38	6.00	.74
	1	10.20	9.00	7.27	6.00	.07
	1	9.00	9.00	6.25	6.00	.35

## Ground Bone.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
American Agricultural Chemical Co. . . . .	9	2.70	2.47	23.85	23.00	73.45	26.55
Apothecaries Hall Co.. . . .	3	2.73	2.47	23.98	23.00	71.42	28.58
	1a	3.95	3.70	22.58	21.00	45.45	54.55
	2a	4.14	3.70	21.69	21.00	54.26	45.74
	2b	4.41	2.47	22.32	22.00	50.75	49.25
Armour Fertilizer Works . . .	3	2.81	2.47	23.85	23.00	77.64	22.36
	3	2.64	2.47	25.00	23.00	70.33	29.67
Associated Chemical Co. . . .	2	2.44	2.47	22.32	23.00	65.43	34.57
Berkshire Chemical Co. . . .	2c	2.31	2.25	29.34	25.00	74.48	25.52
	1d	2.04	3.70	30.10	20.60	79.75	20.25
Joseph Breck & Sons Corp. . .	2e	2.96	2.47	23.47	22.50	67.72	32.28
	1e	2.54	2.47	25.51	22.50	72.29	27.71
	3d	4.12	3.70	22.58	20.00	54.36	45.64
Consolidated Rendering Co. . .	9	2.77	2.05	24.75	22.90	58.61	41.39
	5	2.70	2.05	24.75	22.90	66.30	33.70
Consumers Import Co., Inc. . .	1	3.48	2.47	21.05	22.75	69.56	30.44
Eastern States Farmers' Exchange . . . . .	2	2.60	2.50	23.09	23.00	72.35	27.65
Goulard & Olena, Inc. . . . .	1	2.52	2.50	23.47	23.00	76.00	24.00
	2	3.10	2.40	23.60	22.75	65.86	34.14
	1	2.66	2.40	25.51	22.75	78.10	21.90
Dr. Heinz Co. . . . .	2	1.12	1.00	31.51	29.00	87.58	12.42
International Agricultural Corp. . . . .	4	2.93	2.47	23.85	22.00	68.98	31.02
	2	2.51	2.47	26.28	22.00	69.87	30.13
	1	2.98	2.47	23.73	22.00	66.37	33.63
Old Deerfield Fertilizer Co., Inc. . . . .	2	2.49	2.47	27.30	22.00	69.06	30.94
Olds & Whipple, Inc. . . . .	1	2.27	2.47	24.75	22.00	63.83	36.17
Pawtucket Rendering Co. . . .	1f	3.49	2.05	24.75	22.90	30.23	69.77
John Reardon & Sons Co. . . .	6	2.83	2.47	25.38	22.88	62.38	37.62
	3	3.18	2.47	24.11	22.88	65.28	34.72
Rogers & Hubbard Co. . . . .	1c	3.30	2.47	23.22	22.85	68.83	31.17
	3c	3.92	2.47	22.83	22.85	69.98	30.02
	1g	3.91	3.69	25.77	24.70	97.34	2.66
	3h	4.27	3.29	22.58	20.50	46.32	53.68
N. Roy & Son . . . . .	1	2.54	2.50	25.38	24.00	34.40	65.60
F. Rynveld & Sons . . . . .	1	3.27	2.47	25.13	22.00	74.93	25.07
	3f	2.66	1.85	26.28	22.88	72.21	27.79
Swift & Co. . . . .	2	3.06	2.47	27.04	23.00	88.17	11.83
	2	2.94	2.47	27.30	23.00	83.44	16.56
Van Horne Chemical Co. . . .	4	2.55	2.40	25.51	22.75	77.91	22.09

a Bone and meat.

b Bone meal.

c Fine ground bone.

d Raw bone meal.

e Steamed bone meal.

f 1933 stock.

g Knuckle Bone Flour.

h Strictly Pure Fine Bone.



## Animal Tankage.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
American Agricultural Chemical Co. . . . .	{ 1	10.13	10.00	8.39	7.41	60.44	39.56
	13	10.00	10.00	8.57	7.41	53.34	46.66
	3	7.60	7.40	9.82	9.15	55.58	44.42
Consolidated Rendering Co. . . . .	{ 6	7.86	7.41	11.74	9.15	39.73	60.27
	4	8.03	7.41	11.23	9.15	45.79	54.21
	1	9.40	8.75	8.55	9.00	27.00	73.00
Old Deerfield Fertilizer Co., Inc. . . . .	{ 1	10.07	10.00	8.29	5.00	60.44	39.56
	1	10.15	10.00	7.40	5.00	27.67	72.33
John Reardon & Sons Co. . . . .	{ 1	6.87	5.00	14.16	10.00	67.29	32.71
	3	7.35	7.40	12.12	9.15	42.50	57.50
Rogers & Hubbard Co. . . . .	{ 1	7.45	7.40	11.35	9.15	48.21	51.79
	2	7.83	7.00	11.35	8.00	51.31	48.69
N. Roy & Son . . . . .	{ 1	4.67	4.50	21.30	18.00	17.61	82.39
Woodard Bros. . . . .	{ 1						

## Brand Showing Commercial Shortage of More than \$1 Per Ton.

Armour Fertilizer Works . . . . .	1a	7.01	7.40	8.67	9.15	54.47	45.53
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<sup>a</sup> None of this particular lot which was sampled at the South Deerfield warehouse was sold and as soon as the deficiencies were discovered the product was voluntarily withdrawn from sale by the manufacturer.

## Miscellaneous.

## Cotton Hull Ashes and Wood Ashes.

MANUFACTURER.	Moisture.	PHOSPHORIC ACID.		POTASSIUM OXIDE.		Calcium Oxide.	Magnesium Oxide.	Insoluble Matter.
		Found.	Guaranteed.	Found.	Guaranteed.			
John Joynt . . . . .	{ 16.30 <sup>a</sup>	1.72	1.00	5.32	2.00	30.07	3.26	9.00
	8.00 <sup>a</sup>	2.04	1.00	6.23	3.00	34.02	4.71	7.60
	6.00 <sup>a</sup>	1.91	1.00	5.85	3.00	34.68	3.69	7.40
	6.10 <sup>a</sup>	1.79	1.00	6.60	3.00	36.08	4.27	7.65
	7.60 <sup>a</sup>	1.79	1.50	6.15	2.00	34.27	4.35	8.35
Old Deerfield Fertilizer Co., Inc., . . . . .	{ 5.20 <sup>b</sup>	2.30	2.00	37.81	25.00	6.67	3.69	7.50
	6.85 <sup>b</sup>	3.13	2.00	34.87	33.00	14.17	4.71	11.70
Olds & Whipple, Inc. . . . .	3.30 <sup>b</sup>	2.23	2.00	34.22	30.00	10.87	4.06	6.65

<sup>a</sup> Wood ashes.

<sup>b</sup> Cotton hull ashes.

## Ground Tobacco Stems.

MANUFACTURER AND BRAND.	Moisture.	NITROGEN.		PHOSPHORIC ACID.		POTASH.		Organic Matter.
		Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	
Uniform Products Co., Inc. . . . .	15.00	2.28	1.75	.45	.25	4.39	3.50	68.70

## Pulverized Animal Manure.

MANUFACTURER.	BRAND.	Number of Samples.	TOTAL NITROGEN.		TOTAL PHOSPHORIC ACID.		TOTAL POTASH.		Organic Matter.	Mois- ture.
			Found.	Guaran- teed.	Found.	Guaran- teed.	Found.	Guaran- teed.		
American Agricultural Chemical Co.	{ Pulverized Sheep & Goat Manure Pulverized Sheep & Goat Manure	6	1.24	1.23	1.15	1.00	2.71	2.00	25.75	19.43
		4	1.34	1.23	1.02	1.00	2.93	2.00	26.93	18.55
Apothecaries Hall Co.	Sheep Manure	1	1.85	2.00	2.30	1.00	3.45	2.00	56.25	8.73
Armour Fertilizer Works	{ Sheep and Goat Manure Sheep and Goat Manure	2	1.53	1.25	1.02	1.00	3.78	2.00	36.88	10.95
		2	1.80	1.25	1.02	1.00	3.97	2.00	39.23	12.60
Associated Chemical Co.	Sheep and Goat Manure	2	1.75	1.25	1.66	1.00	3.90	2.00	38.95	15.30
Atkins & Durbrow, Inc.	{ Driconure Driconure	4	1.95	1.00	1.02	1.00	1.90	1.00	79.98	7.55
		4	1.32	1.00	1.15	1.00	1.74	1.00	80.88	6.03
Joseph Breck & Sons Corp.	{ Rams Head Brand Sheep Manure Rams Head Brand Sheep Manure	2	1.39	1.46	1.28	.75	3.49	3.00	45.10	3.00
		2	1.56	1.46	.70	.75	3.43	3.00	39.28	9.00
C. E. Buell, Inc.	Two-In-One Peat-Poultry Manure	1	3.01	2.75	2.68	2.50	1.67	1.25	66.90	10.55
	{ Two-In-One Peat-Poultry Manure Two-In-One Peat-Poultry Manure	2	3.13	2.75	3.44	2.50	1.51	1.25	68.15	12.45
	2	3.13	2.75	3.06	1.75	1.74	1.25	68.00	12.28	
Collins Seed Service Co.	Collins Special Sheep Manure	1 <sup>a</sup>	2.33	2.25	2.81	1.00	3.24	3.00	28.55	14.35
Consolidated Rendering Co.	{ Coreenco Sheep Manure Coreenco Sheep Manure	6	1.51	1.23	1.15	.50	3.22	2.00	31.13	15.73
		6	1.45	1.23	1.15	.50	3.06	2.00	27.20	18.48
Davey Tree Expert Co.	Shredded Cattle Manure	1	2.16	1.00	1.66	1.00	2.33	2.00	65.80	7.58
Dutton Sales Co.	{ Cal-Test Sheep Manure Cal-Test Sheep Manure	1 <sup>a</sup>	1.19	1.50	1.28	1.00	2.07	2.00	28.90	7.15
		2 <sup>a</sup>	1.68	1.50	1.53	1.00	3.37	1.90	48.75	11.75
Emporia Elevator & Feeding Co.	Pulverized Sheep Manure	1 <sup>a</sup>	2.20	2.00	1.66	1.00	3.90	2.00	70.80	10.25
Goulard & Olena, Inc.	{ G. & O. Sheep Manure G. & O. Sheep Manure	1	1.50	1.23	1.15	1.00	3.50	2.00	37.43	5.55
		1	2.06	1.50	1.79	1.00	2.48	2.00	34.78	6.78
International Agricultural Corp.	{ Peat Manure and Soil Builder International Caribbee Sheep Manure International Caribbee Sheep Manure	1	1.12	1.12	3.48	3.48	1.09	1.09	49.28	36.98
		6	1.21	1.02	1.15	.50	2.71	2.00	25.00	17.65
		3	1.29	1.02	.89	.50	2.98	2.00	30.00	19.15

<sup>a</sup> Material carried over from 1933.

Pulverized Animal Manure — Concluded.

MANUFACTURER.	BRAND.	Number of Samples.	TOTAL NITROGEN.		TOTAL PHOSPHORIC ACID.		TOTAL POTASH.		Organic Matter.	Mois- ture.
			Found.	Guaran- teed.	Found.	Guaran- teed.	Found.	Guaran- teed.		
Natural Guano Co. . . . .	{ Sheep's Head Pulverized Sheep Manure Sheep's Head Pulverized Sheep Manure	4 2	2.30 2.45	2.00 2.00	1.40 1.28	1.00 1.00	4.27 4.13	2.00 2.00	74.03 71.78	5.98 7.80
Pacific Manure & Fertilizer Co. . . . .	Groz-It Pulverized Sheep Manure . . . . .	1	1.30	1.50	.64	.75	3.26	2.50	37.00	7.65
Premier Poultry Manure Co. . . . .	{ Shredded Cattle Manure . . . . . Pulverized Poultry Manure . . . . . Pulverized Poultry Manure . . . . . Pulverized Sheep Manure . . . . .	2 5 3 1	2.00 4.73 4.82 3.24	1.65 4.93 4.93 1.65	1.02 2.81 2.55 1.40	.85 2.75 2.75 1.00	2.73 1.30 1.36 2.56	2.00 1.30 1.30 2.00	50.90 66.40 66.45 78.25	5.68 7.30 10.35 6.45
Pulverized Manure Co. . . . .	{ Wizard Pulverized Cattle Manure . . . . . Wizard Pulverized Cattle Manure . . . . . Wizard Pulverized Sheep Manure . . . . . Wizard Pulverized Sheep Manure . . . . .	4 2 3 1	2.06 2.25 2.33 2.36	2.00 2.00 2.00 2.00	1.28 1.53 2.17 1.91	1.00 1.00 1.00 1.00	1.44 2.02 2.94 3.26	1.00 1.00 2.00 2.00	63.45 62.80 71.18 71.90	6.95 10.45 6.50 8.90
Ramshorn Mills . . . . .	Sheep Manure & Wool Waste . . . . .	2	1.63	1.50	.64	.60	4.77	3.75	35.30	6.85
Rogers & Hubbard Co. . . . .	{ Sheep & Goat Manure . . . . . Sheep & Goat Manure . . . . .	4 1 <sup>a</sup>	1.82 1.51	1.25 1.35	1.15 1.02	.75 .75	2.64 4.36	2.00 3.75	51.55 42.35	4.75 8.05
Van Horne Chemical Co. . . . .	Van Horne's Sheep Manure . . . . .	3	1.98	1.50	2.55	1.50	3.04	2.00	40.05	10.80
Walker-Gordon Laboratory Co., Inc. . . . .	Bovung . . . . .	6	2.16	2.00	1.91	2.00	2.05	2.00	79.88	5.45
Brand Showing Commercial Shortage of More than \$1 Per Ton										
W. W. Windle Co. . . . .	Sheep Manure Dusted from Wool . . . . .	1	1.75	2.44	.38	.92	5.70	4.92	36.53	7.08

<sup>a</sup> Material carried over from 1933.

## Stone Meal.

PLANT FOOD ELEMENTS.	MANUFACTURED BY MENDERTH, INC.			MANUFACTURED BY DONALD S. MCCRILLIS.		
	Guaran- teed.	Found.		Guaran- teed.	Found.	
		Soluble in Dilute Hy- drochloric Acid.	By Fusion Method.		Soluble in Dilute Hy- drochloric Acid.	By Fusion Method.
Potassium oxide . . .	3.00	1.47 <sup>a</sup>	3.12	3.00	.08 <sup>a</sup>	.91
Calcium oxide . . .	3.00	1.98	2.41	.56	3.21	4.69
Magnesium oxide . . .	2.00	2.14	2.54	2.00	3.55	3.69
Phosphoric acid . . .	.13	.13	.20	.25	.26	.28

<sup>a</sup> Menderth contained .055% and McCrillis Stone Meal .06% of potash soluble in water.

Note: The commercial value of the plant food contained in one ton of these Stone Meals, based upon their content of acid soluble potash, phosphoric acid, calcium and magnesium, would be about \$1.81 for Menderth and \$1.11 for the McCrillis Stone Meal.

## Definitions and Interpretations Relating to Fertilizers.

The following definitions and interpretations have been adopted as official by vote of the Association of Official Agricultural Chemists at meetings held in 1932, 1933 and 1934.

The term **lime** shall not be used in the registration, labeling, or guaranteeing of fertilizers or fertilizer materials unless the lime is in a form to neutralize soil acidity (the oxide, hydroxide or carbonate, or equivalent magnesia compounds).

The weights appearing on packages of fertilizer, agricultural lime, and liming material shall always mean **net weights**.

**Citrate-soluble ("reverted") phosphoric acid** is that part of the total phosphoric acid in a fertilizer that is insoluble in water but soluble in a solution of citrate of ammonia according to the method adopted by the A. O. A. C.

**Agricultural liming material** is any substance that contains calcium and magnesium in condition and quantity suitable for use in neutralizing soil acidity.

**Phosphate rock** is a natural rock containing one or more calcium phosphate minerals of sufficient purity and quantity as to permit its use, either directly or after concentration, in the manufacture of commercial products.

**Soft phosphate with colloidal clay** is a very finely divided low-analysis by-product from mining Florida rock phosphate by a hydraulic process in which the colloidal material settles at points in artificial ponds and basins farthest from the washer, and is later removed after the natural evaporation of the water.

**Precipitated bone phosphate** is a by-product from the manufacture of glue from bones and is obtained by neutralizing the hydrochloric acid solution of processed bone with calcium hydroxide. The phosphoric acid is chiefly present as dicalcium phosphate.

**Precipitated phosphate** is a product consisting mainly of dicalcium phosphate obtained by neutralizing with calcium hydroxide the acid solution of either phosphate rock or processed bone.

**"Basic" lime phosphate (lime based superphosphate)** is a superphosphate to which liming materials have been added in a quantity at least six per cent (6%) calcium carbonate equivalents in excess of the quantity required to convert all water-soluble phosphate to the citrate-soluble form.

The word **lime** when applied to liming materials means either calcium oxide or calcium and magnesium oxides.

**Mono-ammonium phosphate (fertilizer grade)** is a commercial salt made by combining phosphoric acid with ammonia. It shall contain not less than ten per cent (10%) of nitrogen and not less than forty-six per cent (46%) of available phosphoric acid.

The term **phosphoric acid** designates  $P_2O_5$ .

The term **potash** designates potassium oxide ( $K_2O$ ).

As the terms **phosphoric acid** and **potash** are used universally in guaranteeing and in reporting the analyses of fertilizers it is recommended that the same terms also be used in reporting and discussing the results of analyses of related materials.

### Acid and Basic Fertilizers.

Although acid forming and non-acid forming fertilizers have not been officially defined by the appropriate Committee of the Association of Official Agricultural Chemists of North America, yet at the 1934 meeting of the Association the tentative definitions which follow were submitted by the Committee:

**Acid forming fertilizer** is one which increases the permanent acidity of the soil immediately or when used over a period of years.

**Non-acid forming fertilizer** is one which does not increase the permanent acidity of the soil when used over a period of years.

Although a basic fertilizer was not defined by the Committee, yet there seems justification for the following definition:

A **basic fertilizer** is one which decreases the acidity of the soil upon which it is used.

During the past year considerable interest has developed, particularly in the Southern and Middle-Southern States and in New England, with reference to acid and basic fertilizers. That the question should be of greater interest in those sections of the country where good grades of limestone are not plentiful is but natural. In mixed commercial fertilizers, with the exception of some of the high-analysis mixtures, some form of conditioner or filler is usually necessary, in which case it would seem to be a better practice to use finely ground dolomite where this product can be secured at a low cost than to use some inert material for this purpose. The advantage of dolomite over a high-calcium product for this purpose is that it supplies the element magnesium in available form, and as certain sections of the country show unmistakable evidences of magnesium deficiency this is of considerable importance. Dolomite also has a higher acid-neutralizing value than high-calcium limestone and it does not revert the soluble and available phosphoric acid present in the mixed fertilizer.

In certain parts of the country where desirable lime products are available at a low cost and are therefore freely used for liming soils when needed, some other material of low cost, yet possessing some fertilizing value, might be preferable to ground limestone as a conditioner in fertilizers. Finely ground garbage tankage, finely ground rock phosphate, etc., are examples of such products. The fact should not be ignored that in many instances an acid-forming fertilizer is preferable to a basic mixture, and in general it may be said that an acid-forming fertilizer is not such a great problem to the farmer who has become accustomed to making direct lime applications to his soil when needed.

The subject has seemed of sufficient interest to Massachusetts agriculture to warrant a general survey of the reaction of fertilizers sold in the State during the seasons of 1933 and 1934. The tests of the fertilizers sold in 1933 were not made until early in 1934 after the 1933 fertilizer bulletin had been issued; the results are therefore given in the table which follows and furnish an interesting

comparison with similar results secured on fertilizers sold in 1934. The analytical results secured in this study were obtained by the use of the method developed by Professor W. H. Pierre of the West Virginia Agricultural Experiment Station. The Association of Official Agricultural Chemists have not adopted a method as official for this work although they have recognized its importance and the problem has been referred to the proper referee for cooperative study. The following table shows the extent to which the mixed fertilizer sold in Massachusetts during the years 1933 and 1934 contributed to soil acidity. It should be understood that some brands were found to be basic and some were acid. Those that were basic have been used to offset those that were acid in arriving at the net acidity for each year. Both types have been figured on the tonnage sold in the State, and the results given express both the acidity and basicity in terms of tons of carbonate of lime. The net acidity is arrived at by deducting the total basicity from the total acidity computed in terms of calcium carbonate. Data for each manufacturer's brands are on file and will be furnished to the appropriate manufacturer upon application.

**Summary of Data on Acid and Basic Fertilizers.**

FERTILIZER TONNAGE TESTED.			EXTENT OF ACIDITY OR BASICITY ON FERTILIZER TONNAGE SOLD, RESULTS EXPRESSED IN TONS OF CALCIUM CARBONATE (CaCO <sub>3</sub> ).		
	1933.	1934.		1933.	1934.
Acid . . .	32,843	35,205	Acidity . . . .	5,112	4,812
Basic . . .	4,273	4,523	Basicity . . . .	453	149
Total . . .	37,116	39,728	Net acidity . . .	4,659	4,663

The above table indicates that ground dolomite or limestone is already being used in many fertilizer brands. An increase of 2,612 tons of mixed fertilizer in 1934 contributed about the same net acidity as was found in the fertilizer output for 1933.

## MASSACHUSETTS LAW REGULATING THE SALE OF COMMERCIAL FERTILIZERS.

The law regulating the sale of commercial fertilizers in Massachusetts was revised in 1933. The full text of the law is given below, with the changes made in the revision indicated by italics.

(General Laws, 1920, Chapter 94, Section 1 and Sections 250 to 261, inclusive, as amended by Chapter 67, Acts of 1933.)

### Definitions.

SECTION 1 (in part). The following words as used in this *section and the other sections of this chapter to which their definition is hereinafter respectively limited*, unless the context otherwise requires, shall have the following meanings:

"Agricultural lime", in sections two hundred and fifty to two hundred and sixty-one, inclusive, includes all the various forms of lime intended or sold for fertilizing purposes *or for neutralizing soil acidity*.

"Available phosphoric acid", in sections two hundred and fifty to two hundred and fifty-four, inclusive, and two hundred and fifty-six to two hundred and sixty-one, inclusive, the sum of the *water-soluble and citrate-soluble phosphoric acid*.



"Brand", in sections two hundred and twenty-five to two hundred and thirty-five, inclusive, and two hundred and fifty to two hundred and sixty-one, inclusive, any commercial feeding stuff or cattle feed, and any commercial fertilizer, respectively, distinctive by reason of name, trade mark or guaranteed analysis, or by any method of marking.

"Commercial fertilizer", in sections two hundred and fifty to two hundred and sixty-one, inclusive, dried or partly dried manure, pulverized or ground, and each natural or artificial manure containing nitrogen, phosphoric acid, potash, *calcium oxide or magnesium oxide*, except the excrements and litter from domestic animals when sold in its natural state.

"Copy", in sections two hundred and twenty-five to two hundred and thirty-five, inclusive, and sections two hundred and fifty to two hundred and sixty-one, inclusive, any certified copy.

"Director", in sections twenty-five to thirty-one, inclusive, two hundred and twenty-seven to two hundred and thirty-five, inclusive, and two hundred and fifty-four to two hundred and sixty-one, inclusive, director of the Massachusetts Agricultural Experiment Station.

"Fertilizer", in sections two hundred and fifty to two hundred and sixty-one, inclusive, commercial fertilizer.

*"Fertilizer grade", in sections two hundred and fifty to two hundred and sixty-one, inclusive, shall apply only to fertilizer mixtures and shall represent only the minimum guarantee of its plant food expressed in round numbers and in the following order: — nitrogen, available phosphoric acid and water-soluble potash.*

*"Gypsum or land plaster", in sections two hundred and fifty to two hundred and sixty-one, inclusive, crude calcium sulphate and may contain twenty per cent of combined water.*

"Importer", in sections two hundred and twenty-five to two hundred and thirty-five, inclusive, and in sections two hundred and fifty to two hundred and fifty-four, inclusive, and two hundred and fifty-six to two hundred and sixty-one, inclusive, a person procuring for sale or distribution in the commonwealth commercial feeding stuff or cattle feed, and commercial fertilizers, respectively, from another state or country.

"Label", in sections two hundred and twenty-five to two hundred and thirty-five, inclusive, a printed label required by section two hundred and twenty-five, and in sections two hundred and fifty to two hundred and fifty-four, inclusive, and two hundred and fifty-six to two hundred and sixty-one, inclusive, a printed label required by section two hundred and fifty.

*"Lime", in sections two hundred and fifty to two hundred and fifty-four, inclusive, and two hundred and fifty-six to two hundred and sixty-one, inclusive, calcium oxide (CaO).*

*"Magnesia", in sections two hundred and fifty to two hundred and fifty-four, inclusive, and two hundred and fifty-six to two hundred and sixty-one, inclusive, magnesium oxide (MgO).*

"Package", in sections two hundred and twenty-five to two hundred and thirty-five, inclusive, two hundred and fifty to two hundred and fifty-four, inclusive, and two hundred and fifty-six to two hundred and sixty-one, inclusive, includes sack, bag, tin, box, jar, and any similar receptacle.

"Phosphoric Acid", in sections two hundred and fifty to two hundred and fifty-four, inclusive, and two hundred and fifty-six to two hundred and sixty-one, inclusive, phosphoric anhydrid ( $P_2O_5$ ).

"Potash", in sections two hundred and fifty to two hundred and fifty-four, inclusive, and two hundred and fifty-six to two hundred and sixty-one, inclusive, potassium oxide ( $K_2O$ ).

**Sale of Commercial Fertilizers regulated. Label, Form and Contents.**

SECTION 250. No commercial fertilizer shall be sold or offered or exposed for sale without a plainly printed label accompanying it, displayed in the manner hereinafter set forth, and truly stating the following particulars:

1. The number of pounds of the fertilizer sold or offered or exposed for sale.
2. The name, brand or trade mark, *and in the case of fertilizer mixtures, the fertilizer grade* under which the fertilizer is sold, and, in the case of agricultural lime, its particular form.
3. The name and principal address of the manufacturer, importer or other person putting the fertilizer on the market in the commonwealth.
4. The minimum percentage of each of the following constituents which the fertilizer contains *and which, in case of fertilizer mixtures, shall be expressed in round numbers and in the following order:* (a) nitrogen, (b) available phosphoric acid, (c) potash soluble in distilled water; except that when undissolved bone, untreated phosphate rock, tankage, pulverized natural manures, the ground seeds of plants, or wood ashes are sold unmixed with other substances, the minimum percentage of total phosphoric acid therein may be stated in place of the percentage of available phosphoric acid; and except that in the case of agricultural lime the label shall truly state the following: (a) minimum and maximum percentage of total *calcium oxide*, (b) minimum and maximum percentage of total *magnesium oxide*, (c) minimum percentage of *calcium oxide* and *magnesium oxide* combined as carbonates, (d) and, in the case of *gypsum or land plaster, the minimum percentage of calcium oxide and of calcium sulphate.*
5. If any part of the nitrogen contained in the fertilizer is derived from pulverized leather, hair, wool waste, peat, garbage tankage, or from any inert material whatsoever, *unless processed so that its nitrogen shall show a satisfactory activity by the methods of the Association of Official Agricultural Chemists of North America,* the label shall truly state the specific materials from which such part of the nitrogen is derived.

**When Label is to be affixed.**

SECTION 251. When any fertilizer is sold or offered or exposed for sale in packages, the label shall be affixed in a conspicuous place on the outside thereof. When any fertilizer other than the product of gas houses, known as gas house lime, is offered or exposed for sale in bulk the label shall be affixed in a conspicuous place to the bin or other enclosure where the fertilizer is contained but need not state the number of pounds thereof, and when such fertilizer is sold in bulk the label shall be affixed in a conspicuous place to the vehicle in which the fertilizer is shipped or delivered, and shall state the number of pounds thereof. When any fertilizer is sold in packages furnished by the purchaser the seller shall furnish the labels therefor.

**Certain Provisions of Label recognized as Guaranteed Analysis.**

SECTION 252. The provisions of the printed label required under the two preceding sections relating to the constituents contained in any fertilizer shall be known and recognized as the guaranteed analysis of such fertilizer.

**Sale of Certain Commercial Fertilizers forbidden.**

SECTION 253. No person shall sell, offer or expose for sale a commercial fertilizer or brand of commercial fertilizer, any constituent part of which is of a smaller percentage than as stated on the label of said fertilizer, and no person shall sell, offer or expose for sale a fertilizer or brand thereof with a label which is untrue in any particular.



### **Sale of Commercial Fertilizers regulated. Fees, etc.**

SECTION 254. No person shall sell or offer or expose for sale any commercial fertilizer until he has filed with the director a copy certified by him to be a true copy of the label required by section two hundred and fifty, excepting as to the item as to the number of pounds, for each brand of fertilizer to be sold, offered or exposed for sale and has paid to the said director an analysis fee for each brand aforesaid as follows: eight dollars for nitrogen, eight dollars for phosphoric acid, eight dollars for potash, contained or stated to be contained in any such brand of fertilizer, *eight dollars for magnesium oxide when guaranteed in any such brand of fertilizer*, and twelve dollars for each brand of agricultural lime *and gypsum* except gas house lime; nor unless he holds a valid and uncanceled certificate issued under section two hundred and fifty-six. Any person desiring in any year to sell or to offer or expose for sale any brand of commercial fertilizer in respect of which the requirements of this section as to the filing of a copy of the label thereof and the payment of the analysis fee therefor have not been complied with before January first of said year, may offer or expose for sale and sell the said brand upon filing a certified copy of the label thereof and paying the full analysis fee therefor. No person shall be obliged to file a copy of the label of, or to pay an analysis fee for, any brand of fertilizer for which a certified copy of the label has been filed and the analysis fee paid by the manufacturer or importer of such brand.

No person shall file with the director a false copy of the label of any fertilizer or brand of fertilizer.

### **Same Subject. Statement, Permit, Fee.**

SECTION 255. In addition to the requirements of the preceding section, each person who sells or offers or exposes for sale any commercial fertilizer shall, on or before January first and July first in each year, file with the director a sworn statement in such form as he prescribes setting forth the number of net tons of fertilizer sold by him in the commonwealth during the preceding six months, stating in each case the number of tons of each brand sold, together with a permit allowing the director or his authorized deputy to examine the books of the person filing the statement, for the purpose of verifying the same, and shall thereupon pay to the director a fee of six cents a ton of two thousand pounds for the fertilizers so sold; except that no such statement, permit or fee shall be required in respect of agricultural lime *and gypsum*. The director or his authorized deputy may cancel the certificate for any brand of fertilizer in respect to which the requirements of this section have not been complied with. Whoever sells, offers or exposes for sale a fertilizer or brand of fertilizer without having filed the statement and permit and paid the fee required by this section shall be punished by a fine of not more than five hundred dollars. But no person shall be obliged to file a statement or permit, or to pay the fee required by this section, for any brand of fertilizer for which the statement and permit have been filed and for which the fee has been paid by the manufacturer or importer of such brand.

### **Certificate of Filing of Label, etc. Issue, Revocation, etc. Penalty for Sale, etc., if Certificate not issued, etc.**

SECTION 256. When the certified copy of the label of any brand of fertilizer has been filed, and the proper fees have been paid, the director shall issue a certificate to that effect; and the certificate shall authorize the sale, in compliance with sections two hundred and fifty to two hundred and sixty-one, inclusive, of the brand of fertilizer for which the certificate is issued, up to and including December thirty-first of the year for which it is issued. The said director or his authorized deputy may refuse to issue a certificate for any fertilizer or brand of fertilizer which

does not contain at least one half of one per cent of nitrogen, or one half of one per cent of potash soluble in distilled water, or one per cent of phosphoric acid, or five per cent of *calcium oxide*, or five per cent of *magnesium oxide*, or which contains its potash, phosphoric acid, *calcium or magnesium oxides* in forms substantially insoluble by the methods of analysis for commercial fertilizers and *agricultural lime products* prescribed by the Association of Official Agricultural Chemists of North America, or which does not possess substantial properties as a fertilizer. The director or his authorized deputy may also refuse to issue a certificate for any fertilizer under a name, brand or trade mark which is untrue in any particular, or which, in his opinion, would be misleading or deceptive in any particular, or would tend to mislead or deceive as to the constituents or properties of said fertilizer, and may refuse to issue more than one certificate for any fertilizer under the same name or brand, or to issue a certificate for any fertilizer under a name or brand to the use of which the person seeking it is not lawfully entitled. If a certificate is issued for any fertilizer and it is afterward discovered that the certificate itself, or the granting of it, or the manner of procuring it, was in any respect in violation of any provision of sections two hundred and fifty to two hundred and sixty-one, inclusive, the director or his authorized deputy may cancel the certificate. Whoever sells, offers, or exposes for sale any fertilizer or brand of fertilizer for which no certificate has been issued by the director or his authorized deputy, or the certificate for which has been cancelled, shall be punished by a fine of not more than two hundred dollars.

#### **Annual Analysis. Publication of Reports, etc. Free Analysis.**

SECTION 257. Each commercial fertilizer and brand of commercial fertilizer sold or offered or exposed for sale shall be subject to analysis by the director or by his duly designated deputy. The said director shall make or cause to be made in each year one or more analyses of each fertilizer and brand of fertilizer sold or offered or exposed for sale in the commonwealth, and shall collect the annual analysis fee provided for by section two hundred and fifty-four; and he, his inspectors and deputies, may enter upon any premises where any commercial fertilizer is sold or offered or exposed for sale to ascertain if sections two hundred and fifty to two hundred and sixty-one, inclusive, are complied with, and to take samples for analysis. The analysis of all fertilizers shall be made by the methods adopted by the Association of Official Agricultural Chemists of North America. The said director may publish or cause to be published in reports, bulletins, special circulars or otherwise, the results obtained by said analyses. Said publications shall also contain such additional information in relation to the character, composition, value and use of the fertilizers analyzed as the director sees fit to include. He may make or cause to be made for any person a free analysis of any commercial fertilizer or brand of commercial fertilizer sold or offered or exposed for sale in the commonwealth, but he shall not be obliged to make such free analysis, or to cause the same to be made, unless the samples therefor are taken and submitted in accordance with the rules and regulations which he prescribes. The results of any analysis made in accordance with the aforesaid sections, except a free analysis as aforesaid, shall be sent by the director to the person named in the printed label of the fertilizer analyzed at least fifteen days before any publication of such results.

#### **Taking of Samples for Analysis regulated.**

SECTION 258. Each sample of commercial fertilizer taken for analysis shall be of not less than substantially *two pounds* in weight, and each sample shall be taken, whenever the circumstances conveniently permit, in the presence of the

person selling or offering or exposing for sale the fertilizer sampled, or of a representative of such person. Broken packages shall not be sampled, and all samples shall be taken *by means of a sampling tube so designed as to remove a core extending from the top to the bottom of the package*, from substantially ten per cent of the fertilizer to be sampled, except that if fertilizer is sold or offered or exposed for sale in bulk ten single samples shall be taken from as many different portions of the lot. *An unbroken package of fertilizer, not exceeding twenty-five pounds, may, upon tendering the market price, be taken for the purpose of analysis and the contents thereof shall constitute a suitable and legal sample for said purpose.* All samples taken shall be thoroughly mixed and divided into two nearly equal samples, placed in suitable vessels, and marked and sealed. Both shall be retained by the director, but one shall be held intact by him for one year at the disposal of the person named in the label of the fertilizer sampled.

### **Disposition of Fees, etc.**

SECTION 259. All fees for analysis, or otherwise, under any provision of sections two hundred and fifty to two hundred and sixty-one, inclusive, shall be collected by the director and paid to the commonwealth.

### **Rules and Regulations. Complaints.**

SECTION 260. The director shall enforce sections two hundred and fifty to two hundred and sixty-one, inclusive, and may prescribe and enforce such rules and regulations as to the sale of commercial fertilizers as he deems necessary to enforce said sections, and may prosecute or cause to be prosecuted any person violating any provision of said sections. No complaint based upon an analysis of samples shall be made for any violation of any provision of said sections if samples are taken otherwise than as provided therein. No complaint shall be made for the failure of any fertilizer or brand of fertilizer to meet the guaranteed analysis thereof if the analysis made by the director of such fertilizer or brand shows the amounts of its constituents to be substantially equivalent to the percentages stated in the label.

### **Penalty for Hindering, etc., Director, etc.**

SECTION 261. Whoever hinders or obstructs the director, his inspector, or deputy, in the discharge of any authority or duty conferred or imposed by any provision of sections two hundred and fifty to two hundred and sixty-one, inclusive, and except as otherwise provided in section two hundred and fifty-six, whoever violates any provision of sections two hundred and fifty to two hundred and fifty-four, inclusive, shall be punished by a fine of not less than fifty nor more than two hundred dollars.

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### **Recent Rulings and Regulations.**

Certain fertilizer materials, such as nitrate of soda and potash salts, have in the past been registered by the importers. This is supposed to relieve the fertilizer manufacturer, who may be the retail distributor, from this obligation. Unfortunately, however, in some instances, particularly with nitrate of soda, there is but little cooperation between the importer and manufacturer to see that lots which are sold in the unmixed condition are properly branded as provided by law. In most of the cases that have come to our notice the fault has been with the importer, who has made shipment direct to the local distributor on order from the manufacturer but has neglected to attach the label to each package. The manufacturer who took the order may not have seen the material at any time during the transaction. In other cases the manufacturer may have

made the delivery from stock purchased for mixing purposes and attached his own shipping tags in place of the tags which should have been supplied by the importer who had registered.

Due to this imperfect cooperation on the part of a few importers and distributors, the following regulations have been adopted:

I. The law requires that a label must be displayed on every package of fertilizer before it is offered for sale. In the absence of the label required by law, the distributor or agent who sells the fertilizer at retail must either register the product in his name, in which case he is at liberty to use his own tags, or he must refrain from making a single delivery of the product until he has secured proper tags from the importer and has attached them to the fertilizer.

II. The only tags or markings permissible in the retail distribution of any commercial fertilizer, other than those furnished by the registrant, shall be simple shipping tags which shall give only the name and address of the distributor and consumer.

The above rulings include cottonseed meal sold or used as a fertilizer. Inquiry should therefore be made at this office as to whether any particular brand has been duly registered as a fertilizer by the shipper before it is offered for sale as a source of plant food.

#### DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZER FOR SALE IN MASSACHUSETTS IN 1934.

Acme Guano Co., 311 Marine Bank Bldg., Baltimore, Md.  
 American Agricultural Chemical Co., 285 River St., North Weymouth, Mass.  
 American Cyanamid Co., 535 Fifth Ave., New York, N. Y.  
 American Soda Products Co., 121 East Oak Ave., Moorestown, N. J.  
 Anderson's Nurseries, Riverdale Road, West Springfield, Mass.  
 Apothecaries Hall Co., Waterbury, Conn.  
 Armour Fertilizer Works, 120 Broadway, New York, N. Y.  
 Ashcraft-Wilkinson Co., Atlanta, Ga.  
 Associated Chemical Co., Baltimore Trust Bldg., Baltimore, Md.  
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.  
 Baker Castor Oil Company of Delaware, 120 Broadway, New York, N. Y.  
 Barrett Co., 40 Rector St., New York, N. Y.  
 Barrie Laboratories, Inc., 84 State St., Room 511, Boston, Mass.  
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.  
 Berkshire Chemical Co., Bridgeport, Conn.  
 Bisbee Linseed Co., 2100 Lincoln Liberty Bldg., Philadelphia, Penn.  
 Brague, Inc., South & Maple St., Hinsdale, Mass.  
 Joseph Breck & Sons Corp., 85 State St., Boston, Mass.  
 Buckeye Cotton Oil Co., Cincinnati, Ohio.  
 C. E. Buell, Inc., 6 Beacon St., Boston, Mass.  
 Cairo Meal & Cake Co., Cairo, Ill.  
 Chilean Nitrate Sales Corp., 120 Broadway, New York, N. Y.  
 Clay & Son, Ltd., Temple Mill Lane, Stratford, London, England.  
 Collins Seed Service Co., 131 Beverly St., Boston, Mass.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Consumers Import Co., Inc., 115 Broad St., New York, N. Y.  
 Curley Brothers, Wakefield, Mass.  
 Davey Tree Expert Co., Kent, Ohio.  
 Eastern States Farmers' Exchange, Box 1482, Springfield, Mass.  
 Thomas W. Emerson Co., 213-215 State St., Boston, Mass.  
 Fertilawn Co., Hamilton, N. Y.  
 Florida Humus Co., Zellwood, Florida.  
 Foodndrink, 24 Milk St., Boston, Mass.  
 Ford Motor Co., 3674 Schaefer Road, Dearborn, Mich.  
 H. L. Frost & Higgins Co., 20 Mill St., Arlington, Mass.  
 Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.  
 T. J. Grey Co., 16 South Market St., Boston, Mass.  
 Dr. Heinz Co., College Hill Station, Cincinnati, Ohio.  
 Thomas Hersom & Co., New Bedford, Mass.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 International Agricultural Corp., 38 Chauncy St., Boston, Mass.  
 John Joynt, Lucknow, Ontario, Canada.  
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo, N. Y.  
 Little Tree Farms, Framingham, Mass.  
 Lowell Fertilizer Co., 178 Atlantic Ave., Boston, Mass.  
 Maplevale Leafmold Co., East Kingston, N. H.  
 Donald S. McCrillis, Stony Brook, Mass.  
 Menderth, Inc., 126 State St., Boston, Mass.  
 Merrimac Chemical Co., Inc., Everett Station, Boston, Mass.  
 Miller Fertilizer Co., 1801 Baltimore Trust Bldg., Baltimore, Md.  
 Milwaukee Sewerage Commission, P. O. Box 2079, Jones Island, Milwaukee, Wis.

Natural Guano Co., Aurora, Ill.  
New England Dressed Meat & Wool Co., 174 Somerville Ave., Somerville, Mass.  
New England Rendering Co., Brighton, Mass.  
N. V. Potash Export My., Inc., of Amsterdam, Holland, 19 West 44th St., New York, N. Y.  
Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.  
Olds & Whipple, Inc., 168 State St., Hartford, Conn.  
Pacific Manure & Fertilizer Co., 108-110 Davis St., San Francisco, Cal.  
Pedigreed Seed Co., Inc., 74 Reade St., New York, N. Y.  
F. G. Phillips Co., 12 Circuit Road, Dedham, Mass.  
Maurice Pincoffs Co., 422 Cotton Exchange Bldg., Houston, Texas.  
Plantabbs Corp., Baltimore, Md.  
Planters Manufacturing Co., Clarksdale, Miss.  
Arthur B. Porter, Inc., 55 Dearborn St., Salem, Mass.  
Premier Poultry Manure Co., 327 South LaSalle St., Chicago, Ill.  
Pulverized Manure Co., 431 West 39th St., Chicago, Ill.  
Ramshorn Mills, West Millbury, Mass.  
John Reardon & Sons Co., 51 Waverly St., Cambridge, Mass.  
Rogers & Hubbard Co., Portland, Conn.  
N. Roy & Son, Rear 618 Newport Ave., South Attleboro, Mass.  
F. S. Royster Guano Co., Baltimore, Md.  
F. Rynveld & Sons, 55 West 26th St., New York, N. Y.  
Salem Chemical & Supply Co., Salem, Mass.  
O. M. Scott & Sons Co., Marysville, Ohio.  
Shelton Co., Inc., 480 Bay St., San Francisco, Cal.  
M. L. Shoemaker & Co., Inc., Delaware Ave. & Venango St., Philadelphia, Penn.  
Smith Agricultural Chemical Co., Columbus, Ohio.  
Mrs. James A. Smith, P. O. Box 174, Concord, Mass.  
Standard Wholesale Phosphate & Acid Works, Inc., 1600 Continental Bldg., Baltimore, Md.  
Stimuplant Laboratories, Inc., 42-26 28th St., Long Island City, N. Y.  
Swift & Company, Fertilizer Works, Court Square Bldg., Baltimore, Md.  
F. Sylvester & Son, 397 Proctor Ave., Revere, Mass.  
Synthetic Nitrogen Products Corp., 285 Madison Ave., New York, N. Y.  
Tennessee Corp., Lockland, Ohio.  
Uniform Products Co., Inc., 111 Fifth Ave., New York, N. Y.  
Van Horne Chemical Co., Inc., 399 Halliday St., Jersey City, N. J.  
Victory Fertilizer Corp., 177 State St., Boston, Mass.  
Virginia-Carolina Chemical Corp., 7th & Main St., Richmond, Va.  
Vita-Liza Co., 408 Main St., Cambridge, Mass.  
Walker-Gordon Laboratory Co., Inc., Plainsboro, N. J.  
C. P. Washburn Co., Middleboro, Mass.  
Wilmington Packing Co., New Boston St., Woburn, Mass.  
W. W. Windle Co., 95 West Main St., Millbury, Mass.  
Winslow Nurseries, Needham, Mass.  
Woodard Brothers, Greenfield, Mass.









## INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith<sup>1</sup>

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During the past year 1,070 brands of feed have been registered for sale by 223 manufacturers and dealers; 1,641 samples of feeding stuffs have been collected and subjected to analysis; 176 dealers located in 104 towns and cities have been visited by the feed inspector at least once.

Of the 1,641 samples of feeding stuffs collected, only 96, or 5.9 per cent, were found to be one per cent or more below their protein and fat guarantee, or more than one per cent over the guarantee for fiber and in no case to such an extent as to materially affect their feeding value.

Especial attention should be called to feeding oatmeal, a by-product which finds considerable favor as a food for poultry. In most instances the samples of Alpine feeding oatmeal collected carried from 20 to 30 per cent of cereal other than oats and one shipment was found to contain so much white corn meal that it was subjected to seizure by the Federal authorities. It is quite possible that this admixture of other cereal was not, with the exception of added corn in one instance, a direct attempt at adulteration but rather due to the fact that oats which had not been properly separated from other cereals, dirt, and chaff were hulled and the resulting material ground and sold as feeding oatmeal.

Several samples of ground oats showed an exceptionally high fiber content. These were shipped by Farmers' Service Bureau and Hood Mills Co., of Baltimore, Maryland, both subsidiary companies of Frederick Obrecht & Son of that city. Three samples contained 15.64, 16.20 and 15.15 per cent of fiber. Other samples collected from this source were more nearly normal in fiber content. The average fiber content of 61 samples of ground oats collected during the year was 11 per cent. While it is possible to find oats which carry as high a fiber content as the samples in question, they must be considered as inferior in feeding value.

A number of samples of ground oats showed a liberal admixture of barley and wheat. While Federal standards allow for an admixture of other cereals in certain grades, the mere grinding of "barley mixed oats" does not change the product into "pure ground oats". The quality and grade of whole oats can be determined in a general way by their appearance, which cannot be done when they are finely ground. In justice to the purchaser ground oats should be identified by a tag showing the grade of oats from which they are ground.

Three samples of ground corn and oats (provender) were found to contain approximately as much fiber as ground oats alone. A mixture of corn and oats ground together in equal parts by weight should contain not more than 7 per cent of fiber. A higher percentage of fiber places the product under the

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<sup>1</sup>The following staff members assisted in the inspection: Albert F. Spelman and John W. Kuzmeski, Chemists; Frederick A. McLaughlin, Microscopist; James T. Howard, Inspector; Cora B. Grover, Clerk.

suspicion either that it may be adulterated with oat hulls or that a very inferior grade of oats has been used. One lot sold as Elmore "Special" corn and oats was found to contain 12.6 per cent of fiber. A sample of oats from which this material was made was found to contain 16.8 per cent fiber and in reality consisted very largely of oat cleanings. To many the word "special" conveys the meaning of something superior and when used with a product of this sort must be considered a misnomer.

The Massachusetts Feeding Stuffs Act provides that "each package, lot or parcel of commercial feeding stuff sold, offered, exposed or kept for sale or distributed shall have affixed thereto *in a conspicuous place a tag or label containing a legible and plainly printed statement*" of certain information as set forth in the Act. This has been construed to allow this guarantee to be printed directly on the sack or on an attached tag. It has become the general custom where a tag is used to attach it by sewing when the bag is sewed up by machine. Where the stitches pass through the printed matter the tag cannot be considered legible. It is suggested that the printed matter on the tag be so spaced as to allow for sewing without destroying legibility.

The demand for the examination of special feeds for dogs, game reared in captivity, rabbits and foxes is increasing. Whether or not such work comes within our scope depends upon the definition of the terms "for feeding live stock and poultry" as used in the Act. This wording of the Act should be changed so as to be more explicit in its meaning or a ruling obtained to define more clearly what kinds of animals and birds may be considered as being live stock or poultry.

The moisture content of feeds as given in this bulletin is that obtained at the time the feeds are analyzed. It is probably true that small inspector's samples will dry out to some extent between the time of sampling and analysis and that feeds as found in dealers' stocks will contain a slightly higher water content than reported. The difference is not great, however, and cannot be easily avoided.

Complete Average Analyses of Feeds Collected (Per Cent)  
I. UNMIXED BY-PRODUCTS  
(a) Protein Feeds.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
Cottonseed Meal.											
1	Monarch Brand	Ashcraft-Wilkinson Co.	7.0	43.0	43.0	7.0	6.0	29.4	8.2	10.0	5.4
6	Helmet Brand	Ashcraft-Wilkinson Co.	6.3	41.6	41.0	6.6	5.5	28.9	10.4	10.0	6.2
1	Miss Cairo Brand 41 %	Cairo Meal & Cake Co.	5.9	40.1	41.0	9.8	6.0	28.7	8.4	10.0	7.1
3	Miss Cairo Brand 36 %	Cairo Meal & Cake Co.	6.7	37.3	36.0	6.2	5.0	31.4	11.7	12.0	6.7
2	Eastern States 41 %	Eastern States Farmers' Exchange	7.1	39.8	41.0	6.3	6.0	29.7	10.2	10.0	6.9
8	Bull Brand	Humphreys-Godwin Co.	6.5	42.6	43.0	6.9	5.0	28.3	9.8	11.0	5.9
16	Dixie Brand	Humphreys-Godwin Co.	6.5	41.8	41.0	7.1	5.0	28.1	10.3	12.0	5.9
1	Danish Brand	Humphreys-Godwin Co.	6.5	36.1	36.0	6.4	5.0	34.1	11.1	15.0	5.8
2	High Grade	International Vegetable Oil Co., Inc.	5.9	41.8	41.0	6.1	6.0	30.3	9.7	10.0	6.2
1	41 % Protein	Larrowe Milling Co.	7.4	40.9	41.0	5.8	6.0	30.7	8.3	10.0	6.9
1	"Lovit Brand" 41 %	L. B. Lovitt & Co.	6.3	41.5	41.0	6.7	6.0	29.7	9.1	10.0	6.7
9	41 % Protein	Maurice Pincoffs Co.	7.2	41.8	41.0	5.9	5.0	27.7	12.0	14.0	5.4
1	Tranco Brand 43 %	Transit Milling Co.	6.6	43.7	43.0	6.4	5.0	27.3	10.3	11.0	5.7
7	Texas Bull Brand	Transit Milling Co.	6.6	42.4	41.0	6.9	5.0	28.1	10.3	11.0	5.7
Linseed Meal.											
3	37 % Protein Pure Old Process	Archer-Daniels-Midland Co.	8.8	38.0	37.0	5.1	4.5	34.8	7.9	9.0	5.4
1	Pure Old Process	Archer-Daniels-Midland Co.	6.9	33.9	32.0	5.0	5.0	39.2	8.5	9.0	6.5
6	Bisbee Brand 34 % Protein	Bisbee Linseed Co.	8.0	36.5	34.0	5.8	5.0	34.9	7.8	10.0	7.0
2	Pure Old Process.	Hirst & Begley Linseed Works	7.1	41.4	37.0	6.4	5.0	33.8	6.5	9.0	4.8
3	Pure Old Process.	Kelloggs & Miller, Inc.	8.5	37.6	34.0	6.0	5.0	34.0	7.5	9.0	6.4
3	"K & M" Brand Pure Old Process	Kelloggs & Miller, Inc.	7.4	33.2	32.0	6.1	5.0	38.6	8.9	10.0	5.8
4	Kellogg's 37 % Protein Pure Old Process	Spencer Kellogg & Sons, Inc.	8.3	39.4	37.0	5.5	4.5	34.6	6.9	9.0	5.3
2	37 % Protein Pure Old Process	Mann Bros. Co.	9.4	39.0	37.0	6.4	6.0	32.8	7.0	10.0	5.4
2	Pure Old Process.	Sherwin Williams Co.	8.3	39.2	34.0	5.6	4.5	34.3	7.4	10.0	5.2
Soybean Oil Meal.											
5	41 Per Cent Protein Old Process	Archer-Daniels-Midland Co.	7.9	43.7	41.0	4.9	4.5	32.5	5.6	7.0	5.4
1	Soybean Oil Meal	Shellabarger Grain Products Co.	8.9	43.4	41.0	5.6	4.5	31.6	5.1	7.0	5.4
1	Super Soy	Soya Products, Inc.	9.2	40.3	37.0	5.9	5.0	32.4	4.7	6.5	7.5
4	Staley's	A. E. Staley Manufacturing Co.	7.9	43.4	41.0	5.1	4.5	32.5	5.5	7.0	5.6

Gluten Meal.															
4	Amalzo	.	.	.	.	.	7.6	47.0	40.0	1.1	1.0	42.1	1.1	4.0	1.1
10	Diamond (1934 registration)	.	.	.	.	.	7.4	43.9	43.0	1.7	1.0	43.8	2.1	4.0	1.1
2	Diamond (1933 registration)	.	.	.	.	.	8.8	41.5	40.0	1.9	1.0	45.4	1.4	4.0	1.0
4	Diamond	.	.	.	.	.	7.7	43.9	43.0	1.7	1.0	39.4	4.1	4.0	3.2
2	Union	.	.	.	.	.	7.8	46.3	43.0	0.8	1.0	42.7	1.4	3.0	1.0
Gluten Feed.															
8	Cream of Corn	.	.	.	.	.	7.3	28.5	25.0	3.8	2.0	47.5	7.9	8.5	5.0
3	Clinton	.	.	.	.	.	8.4	27.6	25.0	2.1	2.0	51.7	5.8	8.5	4.4
11	Buffalo	.	.	.	.	.	8.9	27.2	25.0	2.4	2.0	47.9	7.1	8.5	6.5
12	Buffalo	.	.	.	.	.	9.6	22.5	20.0	1.9	1.0	53.3	6.8	7.0	5.9
1	Ke-ok-uk	.	.	.	.	.	8.2	28.3	25.0	2.9	2.0	49.4	6.8	8.5	4.9
4	Douglas	.	.	.	.	.	9.2	27.7	25.0	2.0	1.5	46.6	7.6	8.5	6.9
1	20% Protein Sweetened Douglas	.	.	.	.	.	14.1	21.7	20.0	3.4	1.0	47.8	6.2	7.0	6.8
11	Staley's.	.	.	.	.	.	8.9	27.8	25.0	2.0	1.0	48.6	6.3	8.0	6.4
6	Union	.	.	.	.	.	10.3	27.2	25.0	2.4	1.0	47.9	6.8	8.0	5.4
Distillers' Grains.															
2	Corn Distillers' Dried Grains	.	.	.	.	.	4.1	30.1	27.0	9.4	7.0	42.0	11.3	14.0	3.1
Brewers' Grains.															
3	Brewers' Dried Grains	.	.	.	.	.	6.7	23.4	20.0	4.4	4.5	45.7	15.5	18.0	4.3
1	"Hiquality"	.	.	.	.	.	9.2	24.2	24.0	6.3	5.0	41.2	15.8	19.0	3.3
6	"Eull Brand"	.	.	.	.	.	4.9	27.5	24.0	5.9	6.0	44.2	14.4	17.0	3.1
1	Brewers' Dried Grains	.	.	.	.	.	4.2	27.4	21.0	6.2	5.0	43.9	14.6	15.0	3.7
Red Dog and Low Grade Flour															
1	Red Dog Wheat Flour	.	.	.	.	.	10.2	18.5	15.0	4.1	3.0	62.5	2.2	3.0	2.5
1	Wheat Red Dog	.	.	.	.	.	9.9	18.0	15.0	4.6	4.25	62.8	2.2	4.0	2.5
3	Moon's Fresh Ground White Middlings	.	.	.	.	.	10.3	16.8	15.0	3.2	2.85	65.8	1.8	7.5	2.1
1	Superior Wheat Red Dog	.	.	.	.	.	9.5	18.2	16.0	5.4	3.5	62.4	1.7	4.0	2.8
1	Wheat Red Dog Flour	.	.	.	.	.	8.7	15.9	15.0	4.1	4.0	65.2	1.4	4.0	4.7
Flour Middlings.															
1	*D. & G. Wheat Flour Middlings	.	.	.	.	.	10.1	19.0	16.0	5.1	4.0	55.8	6.0	6.0	4.0
1	Wheat Standard Middlings	.	.	.	.	.	9.9	17.0	15.0	5.9	4.0	57.1	5.8	9.5	4.3
1	*Eshelman Red Rose Wheat Flour Middlings	.	.	.	.	.	10.7	19.4	16.0	4.9	4.0	56.3	4.8	6.0	3.9
1	E-A-Co Hard Wheat Flour Middlings	.	.	.	.	.	9.1	19.1	15.5	5.2	4.5	56.6	5.9	5.0	4.1
4	Moon's Fresh Ground White Middlings	.	.	.	.	.	8.8	18.6	15.0	5.2	3.5	58.8	5.1	7.5	3.5
1	Superior Wheat Red Dog	.	.	.	.	.	8.2	19.4	16.5	5.7	3.5	59.6	4.2	4.0	2.9
1	Alta Hard Wheat Middlings	.	.	.	.	.	8.7	19.9	15.0	5.7	4.5	55.5	6.0	8.5	4.2

\*With screenings.

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 I. UNMIXED BY-PRODUCTS — Continued.  
 (a) Protein Feeds — Continued

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Wheat Standard Middlings.</b>										
3	Copeland's "Dandy Shorts".	Copeland Flour Mills Ltd.	8.8	20.1	16.0	6.4	5.0	53.2	7.2	8.0	4.3
1	*Wheat Standard Middlings	Duluth-Superior Milling Division	8.9	20.3	15.0	5.0	4.0	55.0	6.5	9.5	4.3
1	*Elmore Snow Middlings	Elmore Milling Co., Inc.	8.6	18.3	16.0	5.0	4.25	57.4	6.7	7.0	4.0
1	*Lucky Hard Wheat Standard Midd- lings	Federal Mill, Inc.	8.8	18.8	15.0	5.0	4.5	57.5	6.1	9.5	3.8
1	*Washburn's Gold Medal Hard Wheat Flour Middlings	General Mills, Inc.	9.2	17.4	16.0	5.1	4.0	57.5	6.4	6.0	4.4
2	*Washburn's Gold Medal Hard Wheat Standard Middlings	General Mills, Inc.	10.0	18.0	15.0	5.3	4.0	54.8	7.1	9.5	4.8
1	*Wheat Standard Middlings	Hecker-Jones-Jewell Milling Division	8.5	18.2	15.0	6.2	4.75	54.0	8.1	9.5	5.0
3	*Blackhawk Wheat Standard Midd- lings	International Milling Co.	9.1	17.8	16.0	5.4	4.5	54.4	8.3	8.5	5.0
1	*Wheat Standard Middlings	King Midas Mill Co.	8.2	19.1	15.0	6.1	4.0	53.0	8.9	9.5	4.7
2	*Rex Wheat Middlings	Maple Leaf Milling Co., Ltd.	9.8	18.9	16.0	6.0	5.0	53.9	7.3	7.5	4.1
4	*Niagara Standard Wheat Middlings	Niagara Falls Milling Co.	9.4	19.0	15.5	5.3	4.5	55.5	6.5	7.0	4.3
1	*Wheat Flour Middlings	Northwestern Consolidated Milling Div.	7.9	18.3	15.0	5.4	4.0	56.4	7.4	6.0	4.6
2	*Ogilvie Wheat Shorts	Ogilvie Flour Mills Co., Ltd.	9.1	19.0	16.0	5.9	5.0	53.1	8.3	8.0	4.6
4	*Hard Wheat Occident Standard Mid- dlings	Russell-Miller Milling Co.	8.2	19.6	15.0	6.0	4.0	52.8	8.5	9.5	4.9
1	*Golden Loaf Wheat Middlings	Tennant & Hoyt Co.	7.9	19.9	17.0	5.7	5.0	53.7	8.0	8.0	4.8
	<b>Wheat Mixed Feed.</b>										
1	Amco Mixed Feed	Amendt Milling Co.	9.3	18.9	15.0	4.6	4.0	54.1	7.9	8.0	5.2
1	*Sunfed Wheat Mixed Feed	Commander-Larabee Corp.	9.7	17.2	15.0	5.0	4.0	55.7	7.5	8.5	4.9
2	Cowsey's Heavy Mixed Feed	Nicolas Cowsey Grain Co.	9.6	16.5	16.0	4.2	4.5	58.7	5.8	7.0	5.2
1	*Coweco Heavy Mixed Feed	E. A. Cowsee Co.	9.9	15.5	15.0	4.2	4.0	59.5	6.2	7.0	4.6
1	D. & G. Wheat Mixed Feed	Dietrich & Gambrell, Inc.	6.5	18.8	15.0	4.9	3.5	55.5	8.9	7.5	5.4
1	Full Value Mixed Feed	J. L. Dunnell & Son	9.4	18.6	15.0	5.4	5.0	54.6	8.1	6.0	3.9
1	*Pure Camel Fancy Wheat Feed	Excelsior Milling Co.	8.8	16.6	16.0	4.8	5.0	57.0	7.9	8.5	5.4
5	*Royal Worcester Fancy Mixed Feed	J. B. Garland & Son	10.3	17.8	16.0	4.7	3.5	55.6	7.2	7.0	4.4
2											

[illegible]

\*With screenings.

<sup>1</sup>Contains added salt and calcite flour.









## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## II. PREPARED FEEDS — Continued.

## (a) Protein Feeds — Continued

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	Dairy and Molasses Feeds (more than 15 per cent protein) — Cont.										
3	Beacon Sweet "20"	Beacon Milling Co., Inc.	9.1	22.3	20.0	4.8	4.5	49.2	7.8	9.0	6.8
1	Green Mountain Dairy Ration	Berkshire Coal & Grain Co., Inc.	8.4	25.7	23.0	5.0	5.0	46.4	8.7	10.0	5.8
1	Berkshire Hills Sweet Dairy Feed	Berkshire Coal & Grain Co., Inc.	9.1	22.9	20.0	4.7	4.5	47.6	9.1	12.0	6.6
1	Bidwell 20% Dairy Ration	Black Rock Milling Corp.	9.3	21.9	20.0	3.7	4.0	49.4	7.8	11.0	7.9
2	Borden's Dairy Feed	Borden Grain Co.	8.2	23.0	22.0	5.7	4.5	49.8	7.4	9.0	5.9
1	Brown's Dairy Feed	George B. Brown	7.3	22.8	20.0	4.7	4.0	46.1	11.4	12.0	7.7
1	Community - 20 Dairy Ration	Community Feed Stores, Inc.	9.1	22.0	20.0	5.0	4.0	50.0	7.3	9.0	6.6
2	Hilltop - 20 Dairy Ration	Community Feed Stores, Inc.	7.4	21.5	20.0	4.4	3.5	46.3	12.4	12.5	8.0
2	Cowsey's Dairy Feed	Nicolas Courcy Grain Co.	8.3	24.3	22.0	4.5	4.5	52.1	5.5	7.0	5.3
1	Coweco 1925 Ration	E. A. Cowsee Co.	9.1	24.9	24.0	5.2	4.5	46.5	7.7	10.0	6.6
2	Coweco Lo-Price 20% Dairy Ration	E. A. Cowsee Co.	8.8	21.4	20.0	4.5	3.5	48.4	10.0	9.0	6.9
4	Coweco Sunrise 20% Dairy Ration.	E. A. Cowsee Co.	8.4	21.5	20.0	4.8	3.5	49.4	9.4	10.0	6.5
2	Coweco 20% Ration	E. A. Cowsee Co.	9.3	22.3	20.0	4.3	4.0	49.3	7.7	10.0	7.1
2	Crystal 24% Dairy Ration	Curley Brothers	7.5	25.2	24.0	4.7	5.0	46.9	8.3	9.0	7.4
2	Crystal 20% Dairy Ration	Curley Brothers	7.5	26.2	20.0	4.3	4.0	49.4	8.8	12.0	7.4
1	Delco 24% Dairy Feed	Delaware Mills, Inc.	7.7	25.6	24.0	4.4	5.0	47.4	8.2	9.0	6.7
1	Delco 20% Dairy Feed	Delaware Mills, Inc.	7.9	25.1	20.0	4.6	4.0	50.0	11.0	11.0	6.4
1	Delco Sweet 20% Dairy Feed	Delaware Mills, Inc.	8.7	20.7	20.0	4.0	4.5	47.5	11.5	10.0	7.6
2	Indian Sweet 20% Dairy Feed (1933 registration)	Delaware Mills, Inc.	8.5	20.8	20.0	4.4	4.0	46.2	13.5	12.0	6.6
2	Diauto's Dairy Feed	Frank Diauto	8.8	19.5	17.0	5.0	3.92	56.1	5.7	7.74	4.9
2	Diehl's Dairy Feed	F. Diehl & Son	7.3	21.3	18.0	4.4	3.0	48.4	11.0	14.0	7.6
2	Gambrell's A. I. Dairy Feed	Dietrich & Gambrell, Inc.	8.5	24.2	24.0	4.6	4.6	46.3	8.3	9.0	8.1
2	D. & G. Dairy Feed	Dietrich & Gambrell, Inc.	9.5	20.3	20.0	3.8	4.0	46.4	11.4	12.0	8.6
1	Pen Mar Dairy Feed	Dietrich & Gambrell, Inc.	9.1	20.9	20.0	4.1	4.0	50.6	7.6	9.0	7.7
2	Gambrell's 16% Dairy Feed	Dietrich & Gambrell, Inc.	9.3	17.8	16.0	3.6	3.5	48.2	12.6	12.0	8.5
1	Excel 20% Dairy Ration (1933 registration)	J. L. Dunnell & Son	9.5	21.9	20.0	4.3	4.5	49.4	8.1	10.0	6.8
3	Eastern 24% Dairy Ration Sweetened (1933 registration)	Eastern Grain Co.	9.6	24.7	24.0	4.3	4.0	46.5	8.6	8.5	6.3



Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 II. PREPARED FEEDS — Continued.  
 (a) Protein Feeds — Continued

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	Dairy and Molasses Feeds (more than 15 per cent protein) — Cont.										
2	Grandin's Sweetened 16% Dairy Feed	D. H. Grandin Milling Co.	9.7	18.7	16.0	4.2	4.0	52.0	8.0	10.0	7.4
2	Welcome Dairy Feed	D. Harbeck	8.5	24.3	20.0	4.0	4.0	50.3	8.0	10.0	4.9
1	Hodgkins' Dairy Ration	D. B. Hodgkins' Sons	7.4	22.9	19.0	5.5	4.5	49.6	7.7	10.0	6.9
2	Wantmore 24% Dairy Ration Sweet- ened	Horvitz Grain Co.	8.8	26.0	24.0	4.9	4.0	44.8	8.4	9.0	7.1
1	Wantmore Dairy Ration	Horvitz Grain Co.	7.7	26.0	20.0	5.1	4.0	45.8	9.0	10.0	6.4
1	Wantmore Dairy Ration with Beet Pulp	Horvitz Grain Co.	8.6	22.6	20.0	4.9	4.0	49.2	9.2	10.0	5.5
2	Wantmore 20% Dairy Ration Sweet- ened	Horvitz Grain Co.	8.6	20.8	20.0	4.0	4.0	50.3	8.7	9.0	7.6
2	Jaquith & Co. Dairy Ration	Jaquith & Co.	9.4	19.2	20.0	4.5	4.0	52.8	8.1	8.0	6.0
2	Just Right 20 Dairy Ration	Jersee Co.	8.4	22.3	20.0	4.8	4.5	49.9	8.9	9.0	5.7
7	Larro — The Ready Ration for Dairy Cows (1933 registration)	Larrowe Milling Co.	8.4	21.6	20.0	4.1	4.0	50.0	10.0	12.0	5.9
3	Larro — The Ready Ration for Dairy Cows (1934 registration)	Larrowe Milling Co.	7.4	22.1	20.0	4.4	3.75	49.6	10.5	12.0	6.0
2	"Mansfield" Cow-Ration	Mansfield Milling Co.	9.2	22.4	20.0	4.5	4.0	51.5	7.1	9.0	5.3
4	Sweetened B B Bull Brand "24"	Maritime Milling Co., Inc.	9.0	24.7	24.0	3.9	4.5	44.4	10.1	11.0	7.9
1	Dairy Ration — Sweetened Dollar \$ Maker 24% Pro. Dairy Feed	Maritime Milling Co., Inc.	8.0	24.7	24.0	4.9	3.5	44.3	10.3	12.0	7.8
4	Sweetened Dollar \$ Maker 20% Pro. Dairy Feed	Maritime Milling Co., Inc.	9.2	21.9	20.0	4.1	3.5	47.4	10.4	12.0	7.0
3	B B Hi-Test Dairy Feed 20% Pro. (1933 registration)	Maritime Milling Co., Inc.	7.9	20.5	20.0	4.2	4.5	48.4	10.6	12.0	8.4
1	B B Hi-Test Dairy Feed 20% Pro. Sweetened	Maritime Milling Co., Inc.	8.6	21.6	20.0	4.0	4.0	46.3	11.4	12.0	8.1
1	B B Marmico 16% Pro. Dairy Feed with Molasses	Maritime Milling Co., Inc.	8.6	17.2	16.0	4.2	4.0	49.8	10.8	12.0	9.4
3	Moon's 24% Dairy Ration	Geo. Q. Moon Co., Inc.	9.5	23.9	24.0	4.6	5.0	47.5	6.9	10.0	7.6



## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## II. PREPARED FEEDS — Continued.

## (a) Protein Feeds — Concluded

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
9	Dairy and Molasses Feeds (more than 15 per cent protein) — Conc. Utility Dairy Ration (1933 registration)	St. Albans Grain Co. . . . .	9.1	20.9	20.0	3.4	3.5	48.5	10.4	10.5	7.7
1	Utility Dairy Ration (1934 registration)	St. Albans Grain Co. . . . .	7.9	21.5	20.0	3.9	3.5	47.5	11.6	11.5	7.6
2	Wirthmore 20 Dairy Feed	St. Albans Grain Co. . . . .	7.4	23.9	20.0	5.4	5.0	49.2	7.5	8.5	6.6
2	Wirthmore 20 Dairy Feed Sweetened (1933 registration)	St. Albans Grain Co. . . . .	9.3	21.3	20.0	4.8	4.75	51.7	7.0	8.0	5.9
1	Hygrade 16 Sweetened Milk Ration (1933 registration)	St. Albans Grain Co. . . . .	10.0	17.5	16.0	4.4	3.5	54.2	6.2	8.5	7.7
1	Magnolia Sweet 24 % Dairy Feed (1933 registration)	D. A. Stickell & Sons, Inc. . . . .	9.3	24.3	24.0	4.1	3.5	43.0	10.8	12.0	8.5
2	Dairy Queen Sweet 20 % Milk Maker The Ideal Dairy Ration	D. A. Stickell & Sons, Inc. . . . .	9.8	22.0	20.0	4.2	3.5	47.7	8.4	10.0	7.9
1	Syracuse Dairy Feed	C. H. Symmes . . . . .	9.0	21.8	20.0	4.7	3.5	50.7	6.5	8.5	7.3
1	Red Brand Tioga Dairy Feed	Syracuse Milling Co. . . . .	7.7	25.3	24.0	5.2	4.5	46.8	8.9	12.0	6.1
3	Special Open Formula Dairy Ration 24 %	Tioga-Empire Feed Mills, Inc. . . . .	9.4	27.6	24.0	4.7	4.5	42.0	8.4	10.0	7.9
1	E-Gree Dairy Feed	Tioga-Empire Feed Mills, Inc. . . . .	7.9	24.9	24.0	5.9	4.5	47.5	7.7	8.0	6.1
3	Special Open Formula Dairy Ration 20 %	Tioga-Empire Feed Mills, Inc. . . . .	9.5	22.3	20.0	3.9	3.5	50.2	7.6	10.0	6.5
2	Or-Co Feed	Tioga-Empire Feed Mills, Inc. . . . .	7.6	22.5	20.0	5.4	4.5	49.7	8.6	8.0	6.2
1	United Farmers Milk Pep	Tioga-Empire Feed Mills, Inc. . . . .	9.0	19.9	18.0	3.7	2.5	48.8	10.8	12.0	7.8
1	United Farmers Milkmaker	United Cooperative Farmers, Inc. . . . .	8.1	25.9	24.0	5.3	4.5	45.7	8.7	8.0	6.3
1	"Made Right" Balanced Ration	United Cooperative Farmers, Inc. . . . .	10.1	21.5	20.0	4.9	4.0	50.0	7.4	8.0	6.1
1	"Made Right" Sweet Dairy Feed	C. P. Washburn Co. . . . .	7.0	23.6	22.0	5.0	5.0	49.0	8.8	10.0	6.6
2	Blue Seal Hom-Mix 24 % Dairy Ration	C. P. Washburn Co. . . . .	8.8	21.0	20.0	5.0	4.0	50.8	7.7	8.0	6.7
2	Blue Seal Improved Balanced Ration	H. K. Webster Co. . . . .	7.7	24.7	24.0	6.2	6.0	45.6	9.7	10.0	6.1
2	Blue Seal "20" Dairy Ration	H. K. Webster Co. . . . .	9.0	24.2	24.0	6.0	5.0	47.3	8.4	8.5	5.1
2	Blue Seal Special 20 % Dairy Ration	H. K. Webster Co. . . . .	8.3	22.2	20.0	5.5	5.0	49.8	8.2	8.5	6.0
2			9.0	20.5	20.0	7.8	5.5	44.0	11.1	10.0	7.6

1	Special 24 per cent Dairy Ration	West-Nesbitt, Inc.	8.3	25.1	24.0	3.7	3.5	44.2	11.5	12.0	7.2
2	Super Pure Sweetfeed Dairy Ration	West-Nesbitt, Inc.	8.2	25.3	24.0	4.6	4.5	47.3	8.4	10.0	6.2
2	All Pure 20% Milk Ration	West-Nesbitt, Inc.	8.6	22.4	20.0	4.6	4.5	49.9	8.3	10.0	6.2
3	Pure Feed Dairy Ration	West-Nesbitt, Inc.	7.8	23.8	20.0	4.1	4.0	49.5	9.4	10.0	5.4
3	Special 20% Dairy Ration	West-Nesbitt, Inc.	8.4	21.1	20.0	3.4	3.0	48.5	12.7	12.0	5.9
2	Uniform Sweet Dairy Ration (1933 registration)	West-Nesbitt, Inc.	9.0	16.9	16.0	3.1	3.0	51.1	13.9	14.0	6.0
2	Williams' Balanced Ration	Est. M. G. Williams	7.5	22.3	20.0	5.6	4.0	49.4	9.1	12.0	6.1
2	Bliss Dairy Ration	Stanley Wood Grain Co.	9.3	23.6	22.0	5.0	5.0	48.0	6.8	10.0	7.3
2	Wood's Dairy Ration	Stanley Wood Grain Co.	8.6	21.7	20.0	5.0	5.0	48.7	8.1	10.0	7.9
<b>Hog Feeds.</b>											
1	Gambrill's Hog Meal	Dietrich & Gambrill, Inc.	9.9	19.8	18.0	4.6	4.0	52.1	5.3	8.0	8.3
2	Eastern States Hog Meal	Eastern States Farmers' Exchange	8.3	15.9	14.5	4.5	4.0	61.9	3.6	5.5	5.8
<b>Calf Meals.</b>											
1	Wayne Calf Meal	Allied Mills, Inc.	5.8	26.6	24.0	4.9	4.0	47.7	7.0	7.0	8.0
1	Blatchford's Calf Meal (1933 registration)	Blatchford Calf Meal Co.	8.9	25.7	24.0	4.9	5.0	48.3	4.8	6.75	7.4
2	D. & G. Calf Meal	Dietrich & Gambrill, Inc.	7.6	25.0	21.0	4.1	4.0	53.6	3.7	3.5	6.0
1	Eastern States Calf Starter	Eastern States Farmers' Exchange	8.2	25.2	23.0	4.4	3.5	53.1	3.4	4.0	5.7
1	Elmore "Three Point" Calf Meal	Elmore Milling Co., Inc.	6.3	28.5	24.0	4.4	4.0	52.9	4.0	4.0	5.9
2	Larroe Calf Meal	Larroe Milling Co.	6.9	28.2	23.0	4.1	4.0	54.1	3.7	3.3	6.0
1	Purina Calf Chow	Purina Mills	6.4	29.1	27.0	3.2	3.2	52.6	3.3	4.5	5.4
2	Wirthmore Calf Meal	St. Albans Grain Co.	8.6	24.5	24.0	6.3	5.5	50.8	3.9	4.0	5.9

## (b) Starchy Feeds.

3	Amco 12% Fitting Rations.	Allied Mills, Inc.	9.4	13.5	12.0	4.9	3.0	60.7	5.4	9.0	6.1
4	Eastern States Fitting Ration	Eastern States Farmers' Exchange	9.7	14.8	12.0	4.1	3.5	59.0	6.6	7.0	5.8
2	Eastern States Highland 12 (1933 registration)	Eastern States Farmers' Exchange	9.1	14.6	12.0	3.9	3.5	54.8	11.0	11.5	6.6
5	Purina Fitting Chow	Purina Mills	9.8	16.1	13.5	3.8	2.6	52.8	11.0	12.0	6.5
1	Hygrade Fitting Ration	St. Albans Grain Co.	8.7	15.6	12.0	4.9	4.5	57.2	5.8	18.0	7.8
4	Utility Pasture Ration	St. Albans Grain Co.	9.3	15.7	14.0	3.4	3.0	51.2	13.5	13.0	6.9
1	United Farmers Fitting Ration	United Cooperative Farmers, Inc.	8.4	15.4	12.0	4.8	3.5	58.7	6.9	7.0	5.8
<b>Stock and Horse Feeds (less than 10 per cent fiber).</b>											
1	Beacon Special Horse Feed (1933 registration)	Beacon Milling Co., Inc.	9.8	12.1	10.5	3.2	3.0	66.7	6.1	6.0	2.1
1	Cayuga Stock Feed	Beacon Milling Co., Inc.	5.7	18.0	15.0	4.4	3.5	55.7	9.2	9.0	7.0



## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## II. PREPARED FEEDS — Continued.

(b) *Starchy Feeds* — Continued

Num- ber of Sam- ples.	FEEDESTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Stock and Horse Feeds (less than 10 per cent fiber.) — Conc.</b>										
1	White Stock Feed	J. B. Garland & Son	9.0	9.0	8.0	3.3	3.0	64.4	9.6	14.0	4.7
1	B B Bull Brand Stock Feed	Maritime Milling Co., Inc.	7.6	10.1	9.0	5.0	3.5	63.8	9.4	12.0	4.1
1	B B Hi-Test Stock Feed (Sweetened)	Maritime Milling Co., Inc.	8.8	7.4	9.0	3.1	3.0	68.5	7.9	12.0	6.3
1	Moon's Stock Feed	Geo. Q. Moon & Co., Inc.	9.0	11.7	9.0	4.4	3.0	61.4	7.2	12.0	5.4
6	Wirthmore Stock Feed	St. Albans Grain Co.	7.3	10.3	9.0	5.1	4.0	63.1	8.8	9.5	6.3
2	"Made Right" White Stock Feed	C. P. Washburn Co.	8.8	10.9	9.0	5.0	4.0	65.0	7.4	10.0	2.9
2	Wood's Stock Feed	Standley Wood Grain Co.	9.8	12.6	8.0	4.6	3.5	60.8	6.3	12.0	5.9
	<b>Stock and Horse Feeds (10 to 12 per cent fiber).</b>										
2	Coweco Stock Feed	E. A. Cowee Co.	7.0	9.9	9.0	5.2	4.0	61.3	10.9	11.0	5.7
1	Premier Stock Feed	Curley Brothers	7.4	10.8	9.0	4.0	4.5	60.4	11.3	13.5	6.1
1	Frederick Stock Feed	Dietrich & Gambrell, Inc.	7.7	10.0	7.5	5.2	3.0	60.6	11.6	12.0	4.9
4	Elmore Stock Feed	Elmore Milling Co., Inc.	7.0	10.4	10.0	5.4	3.0	61.8	11.4	12.0	4.0
3	Eshelman Red Rose Stock Feed	John W. Eshelman & Sons	7.3	10.3	9.0	3.8	3.0	63.4	11.1	11.0	4.1
1	Quality Stock Feed	Farm Service Stores, Inc.	7.6	10.7	9.0	4.2	3.0	61.6	11.4	12.0	4.5
1	Red Tag A Chop Feed	J. B. Garland & Son	9.8	7.0	7.0	3.9	3.0	60.7	10.1	14.0	5.7
1	White Stock Feed	J. B. Garland & Son	9.5	9.4	8.0	4.4	3.0	61.4	10.2	14.0	5.1
3	Grandin's Stock Feed	D. H. Grandin Milling Co.	7.9	10.4	8.5	4.7	4.0	61.3	11.3	12.0	4.4
1	B B Bull Brand Stock Feed	Maritime Milling Co., Inc.	7.3	9.2	9.0	4.1	3.5	63.8	11.2	12.0	4.4
3	Park & Pollard Stock Feed	Park & Pollard Co.	6.6	10.4	8.5	4.9	4.0	61.9	10.5	12.0	5.7
1	Quaker Sugared Schumacher Feed	Quaker Oats Co.	8.7	9.0	10.0	3.0	3.0	61.9	11.1	12.0	6.3
2	Wirthmore Stock Feed	St. Albans Grain Co.	8.6	9.6	9.0	4.6	4.0	60.4	11.1	9.5	5.7
2	Blue Seal Stock Feed	H. K. Webster Co.	7.0	11.9	8.5	5.0	3.5	59.2	10.9	11.0	6.0
1	Williams' Stock Feed	Est. M. G. Williams	8.6	11.4	10.0	4.7	4.0	59.5	11.1	12.0	4.7

Stock and Horse Feeds (more than 12 per cent fiber.)											
1	Community Stock Feed (1933 registration)	Community Feed Stores, Inc.	8.1	9.7	9.0	4.4	3.25	61.8	12.0	12.0	4.0
1	Courcy's Stock Feed	Nicolas Courcy Grain Co.	8.5	11.7	10.0	3.6	3.0	59.0	12.2	12.0	5.0
1	Coweco Stock Feed	E. A. Cowee Co.	5.9	9.9	9.0	4.6	4.0	60.7	13.4	11.0	5.5
1	Crystal Stock Feed	Curley Brothers	7.3	14.0	12.0	4.5	4.0	55.0	12.0	6.7	6.4
1	Premier Stock Feed	Curley Brothers	6.8	10.2	9.0	3.0	4.5	61.4	12.2	13.5	6.4
3	Delaware White Stock Feed (1933 registration)										
1	Delaware Mills, Inc.	Delaware Mills, Inc.	7.3	10.9	9.0	3.7	3.0	58.3	13.7	12.0	6.1
1	Big 4 Dairy Feed	Dietrich & Gambrell, Inc.	8.4	16.5	11.0	3.2	2.5	49.0	14.4	16.0	8.5
1	Quality Stock Feed	Farm Service Stores, Inc.	7.7	10.2	9.0	3.6	3.0	60.4	13.2	12.0	4.9
1	White Stock Feed	J. B. Garland & Son	9.5	9.5	8.0	3.5	3.0	60.2	12.5	14.0	4.3
1	Garland's HiCarbo Ration	J. B. Garland & Son	7.6	9.8	7.0	3.4	2.0	57.8	14.9	17.0	6.5
2	Moon's Stock Feed	Geo. Q. Moon & Co., Inc.	7.7	10.7	9.0	5.2	3.0	57.4	13.0	12.0	5.0
1	Quaker Sugared Schumacher Feed	Quaker Oats Co.	6.3	10.6	10.0	4.1	3.0	58.9	13.1	12.0	7.0
1	Stratton's '24' Stock Feed	Stratton & Co.	8.1	8.6	7.5	4.9	2.83	61.3	13.1	12.0	4.0
1	Williams' Stock Feed	Est. M. G. Williams	9.7	11.1	10.0	4.2	4.0	57.1	13.2	12.0	4.7
Molasses Feeds (less than 15 per cent protein.)											
1	June Pasture	Allied Mills, Inc.	13.7	14.4	10.0	1.2	0.5	46.8	14.4	21.0	9.5
4	Wayne Supreme Horse Feed	Allied Mills, Inc.	10.2	11.0	9.5	3.6	3.0	66.2	6.1	8.0	2.9
2	Wonder Horse & Mule Feed	Arcady Farms Milling Co.	10.8	10.4	9.0	3.8	3.0	66.2	5.9	10.0	2.9
2	Fort Orange Brand Horse Feed	Barber & Bennett, Inc.	10.1	11.4	9.0	3.7	3.0	62.7	7.6	10.0	4.5
2	Coweco Horse Feed	E. A. Cowee Co.	9.7	13.6	10.0	4.0	3.0	62.5	5.6	11.0	4.6
2	Crystal Horse Feed	Curley Brothers	8.5	13.4	11.0	3.8	3.0	62.9	7.5	10.0	3.9
3	Gambrell's Horse Feed	Dietrich & Gambrell, Inc.	11.2	10.3	10.0	3.1	3.5	66.6	5.6	12.0	3.2
4	Eastern States Horse & Calf Ration	Eastern States Farmers' Exchange	9.9	12.4	10.5	4.0	3.5	61.9	6.5	7.0	5.3
1	Elmore's Sugared Feedall (1933 registration)										
1	Elmore's Sugared Feedall (1933 registration)	Elmore Milling Co., Inc.	6.9	15.4	10.0	3.7	3.0	48.6	17.8	18.0	7.6
3	Elmore Horse Feed with Molasses	Elmore Milling Co., Inc.	9.1	11.2	9.0	3.4	2.5	66.7	6.5	11.0	3.1
2	Eshelman Red Rose 85 Horse Feed	John W. Eshelman & Sons	9.8	11.6	9.0	4.0	3.0	63.9	7.4	10.0	3.3
4	Quality Horse Feed	Farm Service Stores, Inc.	8.3	11.0	8.0	3.7	2.0	64.4	8.8	9.0	3.8
1	Garland's Molasses Horse Feed	J. B. Garland & Son	9.2	11.1	10.0	3.2	2.5	63.5	8.0	10.0	5.0
2	Grandin's Sweetened Horse Feed	J. B. Grandin Milling Co.	10.7	11.3	9.5	3.8	3.5	65.0	6.1	11.0	3.1
2	Jaquith & Co., Horse Feed	Jaquith & Co.	8.9	13.1	12.0	3.6	3.5	64.0	6.2	7.0	4.2
2	B B Bull Brand Horse Feed with Alfalfa and Molasses										
1	Maritime Milling Co., Inc.	Maritime Milling Co., Inc.	10.3	10.5	8.0	3.6	2.0	65.7	5.7	10.0	4.3
4	Moon's Horse Feed with Molasses	Geo. Q. Moon & Co., Inc.	9.8	9.1	9.0	3.2	3.0	65.6	8.6	10.0	3.7
2	Domino Vim-O-Lene Horse Feed	Nowak Milling Corp.	9.6	10.6	9.5	3.5	3.0	67.9	5.8	9.0	2.6
3	Park & Pollard Horse Feed	Park & Pollard Co.	8.7	13.0	10.0	4.1	3.5	62.7	8.0	9.0	3.5
1	Purina Bulky Omotene Chow	Purina Mills	8.8	11.9	10.0	3.7	3.2	64.7	7.3	11.0	3.6



## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## II. PREPARED FEEDS — Concluded.

(b) *Starchy Feeds* — Concluded

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Molasses Feeds (less than 15 per cent protein.) — Conc.</b>										
4	Purina Omolene Chow (1933 registration)	Purina Mills.	9.4	11.9	10.0	4.1	3.2	63.5	7.5	9.0	3.6
2	Purina Bulky Las Chow (Buffalo Mill)	Purina Mills	9.0	11.6	9.0	2.3	1.3	55.6	13.2	15.0	8.3
2	Protene Sweet Roughage Feed (Buffalo Mill) (1933 registration)	Purina Mills.	7.7	6.1	6.0	1.0	1.0	52.4	26.7	30.0	6.1
1	Quaker Thorobred Horse Feed (1933 registration)	Quaker Oats Co.	10.6	11.5	10.5	3.6	3.5	65.5	5.2	8.0	3.6
1	Wirthmore Horse Feed	St. Albans Grain Co.	9.5	11.2	9.8	3.5	3.25	65.7	6.4	9.0	3.7
1	Stickell's Horse & Mule Feed (1933 registration)	D. A. Stickell & Sons, Inc.	9.1	9.4	9.0	2.8	2.5	66.7	7.7	12.0	4.3
3	Neverfail Horse Feed	Triega-Emper Feed Mills, Inc.	10.1	11.6	10.0	4.0	3.5	64.4	6.1	10.0	3.8
1	United Farmers Horse Feed	United Cooperative Farmers, Inc.	9.4	13.1	10.5	3.8	3.5	62.7	6.9	6.5	4.1
1	Blue Seal Horse Feed.	H. K. Webster Co.	8.7	12.1	10.5	4.5	3.5	64.6	5.9	7.5	4.2
2	Pure Feed Horse Ration (1933 registration)	West-Nesbitt, Inc.	9.5	12.3	9.0	3.1	3.0	60.2	10.9	10.0	4.0
	<b>Miscellaneous Feeds.</b>										
1	Dried Grains	A. H. Brown & Bros.	6.1	12.7	10.0	4.7	2.5	55.1	16.9	20.0	4.5
2	Ground Oats & Banner Feed	F. Diehl & Son, Inc.	6.3	12.9	6.0	3.9	2.0	56.7	15.1	30.0	5.1
4	Banner Feed	Quaker Oats Co.	5.5	13.5	13.0	4.5	4.5	50.2	18.6	18.0	6.7
3	"Made Right" Mixed Feed	C. P. Washburn Co.	9.0	18.9	15.0	5.3	4.0	54.7	7.7	8.0	4.4

## III. POULTRY FEEDS.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Alfalfa Meal.</b>										
1	Beacon Rabbit Alfalfa (Cut)	Beacon Milling Co., Inc.	5.1	16.6	13.0	1.6	1.0	37.8	30.3	33.0	8.6
1	Alfalfa Leaf Meal <sup>1</sup>	A. B. Caple Co.	8.5	18.3	20.0	2.4	2.5	39.8	19.8	18.0	11.2
3	Leafy Alfalfa Meal (1933 registration)	A. B. Caple Co.	7.4	18.1	18.0	2.8	2.0	44.1	19.4	20.0	8.2

8	Alfalfa Meal.	A. B. Caple Co.	14.7	13.0	1.8	1.0	39.3	30.1	33.0	6.5
2	Alfalfa Stem Meal <sup>2</sup>	A. B. Caple Co.	12.8	9.0	1.7	0.8	39.3	30.1	40.0	6.0
1	Alfalfa Leaf Meal (Leafalfa Brand) (1933 registration) <sup>1</sup>	Denver Alfalfa Milling & Products Co.	20.1	20.0	2.4	1.5	42.3	18.2	18.0	10.4
1	Alfalfa Meal	Denver Alfalfa Milling & Products Co.	14.0	13.0	1.7	1.0	37.1	31.5	33.0	10.6
5	Fernando Ideal Greens Suncured	Fernando Valley Milling & Supply Co.	20.3	20.0	2.4	3.0	39.2	20.6	18.0	10.6
3	Fernando Alfalfa Meal Fine Ground.	Fernando Valley Milling & Supply Co.	16.2	17.0	2.0	2.0	37.8	28.6	25.0	9.1
2	Grandin's Poultry Green Food, Alfalfa, Beet Pulp, Molasses	D. H. Grandin Milling Co.	12.4	10.0	1.4	1.0	47.2	22.0	25.0	6.4
3	Peevee Alfalfa Leaf Meal (1933 registration) <sup>1</sup>	Pecos Valley Alfalfa Mill Co.	7.1	20.0	2.5	2.5	40.2	18.8	18.0	10.4
2	Velvet Meal (1933 registration)	Pecos Valley Alfalfa Mill Co.	16.2	17.0	2.8	1.5	39.1	22.3	23.0	11.0
1	Alfalfa Meal	Pecos Valley Alfalfa Mill Co.	7.4	13.0	1.6	1.5	35.9	31.1	36.0	9.8
6	Sunshine Leaf Meal (1933 registration) <sup>1</sup>	United Milling Corp.	18.8	20.0	2.5	3.0	39.5	21.9	18.0	10.3
<b>Alfalfa Leaf Meal.</b>										
2	Alfalfa Leaf Meal	A. B. Caple Co.	19.9	20.0	2.9	2.5	42.7	15.6	18.0	9.3
3	Alfalfa Leaf Meal (Leafalfa Brand) (1933 registration)	Denver Alfalfa Milling & Products Co.	21.8	20.0	2.5	1.5	40.8	16.6	18.0	11.3
1	Fernando Ideal Greens Suncured	Fernando Valley Milling & Supply Co.	23.3	20.0	2.6	3.0	38.0	17.6	18.0	12.5
2	Peevee Alfalfa Leaf Meal (1933 registration)	Pecos Valley Alfalfa Mill Co.	7.1	20.0	2.5	2.5	41.5	16.2	18.0	11.3
<b>Chick Starting and Growing Feeds</b>										
1	Wayne All Mash Chick Starter (1933 registration)	Allied Mills, Inc.	18.0	17.0	4.8	4.0	55.5	6.1	6.0	8.0
1	Wayne All Mash Chick Starter with Cod Liver Oil and Sardine Oil (1933 registration)	Allied Mills, Inc.	18.4	17.0	6.0	4.0	53.7	4.9	6.0	8.1
2	Wayne All Mash Grower (1933 registration)	Allied Mills, Inc.	18.6	16.0	5.8	4.0	53.3	5.0	6.0	7.8
2	Wayne All Mash Grower with Cod Liver Oil and Sardine Oil (1933 registration)	Allied Mills, Inc.	17.9	16.0	5.6	4.0	53.1	5.6	6.0	8.5
1	Wayne Starter and Grower with Cod Liver Oil and Sardine Oil (1933 registration)	Allied Mills, Inc.	16.4	16.0	6.5	3.5	55.9	5.6	6.0	7.3
1	Ames Growing Mash with Cod Liver Oil	A. P. Ames Co.	17.9	17.0	5.7	4.5	54.0	5.8	6.0	9.3
1	Arceady All Mash Chick Starter and Grower (1933 registration)	Arceady Farms Milling Co.	17.5	17.0	5.5	5.0	57.1	5.8	5.0	7.9
2	Arceady Besbet Growing Mash (1933 registration)	Arceady Farms Milling Co.	15.6	16.0	4.7	4.0	54.9	6.4	7.5	9.4

<sup>1</sup>Misbranded as Leaf Meal.<sup>2</sup>Misbranded as Stem Meal.

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Chick Starting and Growing Feeds — Cont.</b>										
1	Double Value Growing Mash	Barber & Bennett, Inc.	9.7	20.5	17.5	6.2	4.0	50.8	6.1	6.5	6.7
2	Beacon Complete Starting Ration	Beacon Milling Co., Inc.	8.4	19.0	17.5	4.7	4.0	55.0	4.7	6.0	8.2
2	Beacon Growing Mash	Beacon Milling Co., Inc.	8.7	18.8	17.0	5.5	4.0	52.1	5.5	7.0	9.4
1	Beacon's Cayuga Growing Mash	Beacon Milling Co., Inc.	9.4	17.8	16.0	5.6	4.0	52.5	5.9	7.0	8.8
1	Beacon's Charlott Starter and Grower with Cod Liver Oil	Beacon Milling Co., Inc.	6.8	18.3	16.0	5.6	4.0	54.6	6.1	7.0	8.6
1	Community Chick Mash (Starter-Grower-Broiler)	Community Feed Stores, Inc.	8.7	18.9	17.0	5.3	5.0	52.8	6.7	8.0	7.6
2	Courcy's Growing Feed	Nicolas Courcy Grain Co.	9.4	18.7	17.0	4.8	4.0	53.0	4.8	5.0	9.3
1	Eastern Starting Feed	Nicolas Courcy Grain Co.	9.6	18.9	17.0	4.3	5.0	54.1	4.3	5.0	8.8
1	Coweco Growing Mash	E. A. Cowee Co.	8.6	14.9	14.0	5.2	4.5	57.7	4.3	6.0	9.3
1	Crystal Growing Mash	Curley Brothers	7.9	17.0	16.0	4.3	5.0	59.9	4.1	5.0	6.8
2	Crystal All Grain Starting Food	Curley Brothers	7.7	17.1	15.0	4.7	5.0	61.3	3.5	4.0	5.7
1	Diauto's Fancy Chick Growing Mash (1934 registration)	Frank Diauto	7.7	21.3	20.0	5.4	4.0	52.6	4.8	5.0	8.2
1	Diauto's Fancy Chick Growing Mash (1933 registration)	Frank Diauto	9.1	19.0	17.0	5.3	4.0	54.5	4.2	5.0	7.9
1	Diauto's Chick Starter	Frank Diauto	7.7	21.4	19.0	5.7	4.96	52.3	4.9	3.68	8.0
2	Frederick Growing Mash	Dietrich & Gambrell, Inc.	8.0	18.8	16.0	6.0	4.0	51.5	7.1	8.0	8.6
1	All Mash Starter & Grower	Dietrich & Gambrell, Inc.	5.8	18.7	14.0	5.9	4.0	59.3	4.4	4.0	5.9
3	Eastern States Starting & Broiler Ration	Eastern States Farmers' Exchange		20.3	18.5	5.2	4.0	53.9	4.8	5.0	7.6
1	Elmore Growing Mash	Elmore Milling Co., Inc.	6.3	21.1	17.0	6.3	4.0	51.5	6.9	8.0	7.9
1	Elmore Chixsaver	Elmore Milling Co., Inc.	7.6	19.8	16.5	5.7	4.0	55.9	4.6	8.0	7.9
1	Eshelman Red Rose All Mash Starter	John W. Eshelman & Sons	9.2	19.0	16.0	5.5	4.0	52.9	5.3	6.5	8.1
1	Big C Growing Mash	Farm Service Stores, Inc.	7.6	18.7	18.0	3.4	4.0	54.5	6.8	7.0	9.0
1	Narragansett Indian Growing Mash.	Farm Service Stores, Inc.	8.4	18.6	16.0	4.3	4.0	53.9	5.9	8.0	8.9
1	Quality Chick Starter	Farm Service Stores, Inc.	7.6	20.7	16.0	4.8	4.0	53.5	5.6	6.0	7.8
2	Fountain's Buttermilk Starting Feed	Fred A. Fountain	9.5	19.5	17.0	4.7	4.0	55.5	4.3	6.0	6.5
1	Fountain's Buttermilk Growing Feed	Fred A. Fountain	9.7	19.3	16.0	5.1	4.5	54.0	5.1	7.0	6.8
1	Garland's Fancy Chick Mash	J. B. Garland & Son	10.1	17.7	17.0	5.0	5.0	54.0	5.2	8.0	8.0
1	Eventually Gold Medal Chick Ration	General Mills, Inc.	7.7	18.2	15.5	5.1	4.0	55.7	5.1	6.0	8.2



Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Chick Starting and Growing Feeds—Conc.</b>										
3	"Made Right" Starting & Growing Feed	C. P. Washburn Co.	8.4	21.3	20.0	5.6	5.0	51.4	5.9	5.0	7.4
1	Blue Seal Chick Starter	H. K. Webster Co.	6.7	19.8	17.5	4.9	4.0	53.5	6.3	6.0	8.8
2	Blue Seal Growing Mash Fortified with Cod Liver Oil	H. K. Webster Co.	7.0	20.6	17.0	4.8	4.0	52.0	7.0	6.5	8.6
2	Blue Seal Starting Ration with Cod Liver Oil (1933 registration)	H. K. Webster Co.	7.9	20.4	17.0	4.8	4.0	54.0	4.5	4.5	8.4
1	Pure Feed Growing Mash	West-Nesbitt, Inc.	7.4	20.2	18.0	6.0	4.5	50.4	6.0	5.5	10.0
2	Williams' Growing Feed (1933 registration)	Est. M. G. Williams	9.2	19.0	15.0	4.8	4.0	53.2	5.3	7.0	8.5
1	Preferred Starting & Growing Feed	Stanley Wood Grain Co.	10.1	17.4	16.0	3.9	4.0	54.5	4.9	6.0	9.2
	<b>Laying Mash.</b>										
1	Wayne Mash Concentrate.	Allied Mills, Inc.	6.4	36.6	32.0	3.8	4.0	29.4	7.2	8.0	16.6
2	Wayne 26 % Mash Supplement (1933 registration)	Allied Mills, Inc.	8.6	27.5	26.0	4.6	4.0	36.6	6.8	8.0	15.9
1	Wayne Breeder Mash	Allied Mills, Inc.	7.4	21.2	18.0	6.3	4.0	49.1	6.9	7.0	9.1
3	Wayne Egg Mash	Allied Mills, Inc.	8.0	19.6	18.0	5.2	3.5	52.3	5.8	7.0	9.1
1	Empire Egg Mash	Allied Mills, Inc.	8.7	17.3	16.5	5.9	4.0	56.9	6.4	7.0	7.4
2	Empire Egg Mash with Sardine Oil	Allied Mills, Inc.	8.7	17.6	16.5	5.4	3.5	54.8	6.1	7.0	7.4
2	Ames Egg Mash with Cod Liver Oil	A. P. Ames Co.	7.2	21.5	20.0	5.7	5.0	48.1	5.0	5.0	11.4
3	Zip Egg Mash	Anchor Mills	8.1	19.2	18.0	6.4	4.0	52.7	5.9	6.0	7.7
5	Arcady Beabot Laying Mash	Arcady Farms Milling Co.	8.8	20.3	20.0	4.8	4.0	48.3	5.7	7.0	12.1
2	University All Mash Ration (1933 registration)	Arcady Farms Milling Co.	8.2	16.1	16.0	5.0	4.5	54.3	6.6	7.0	9.8
2	Beacon Egg Mash with Buttermilk	Beacon Milling Co., Inc.	8.5	23.3	22.0	5.4	4.5	45.7	6.4	7.0	10.7
2	Beacon Breeders Mash with Buttermilk	Beacon Milling Co., Inc.	7.7	21.9	20.0	5.0	4.0	49.0	6.3	7.0	10.1
1	Beacon's Cayuga Laying Mash with Buttermilk	Beacon Milling Co., Inc.	8.8	21.4	20.0	5.6	4.0	48.7	6.4	7.0	9.6
1	Green Mountain Laying Mash	Berkshire Coal & Grain Co., Inc.	8.7	19.5	19.0	5.2	4.0	47.5	6.8	8.0	12.3
2	Bidwell Dry-Mash	Black Rock Milling Corp.	8.3	19.1	18.0	4.7	3.0	54.6	5.6	8.0	7.7











Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.		Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
2	Fattening and Broiler Feeds.											
2	Wayne Broiler Ration (1933 registra- tion)	Allied Mills, Inc.	20.1	13.0	6.2	3.5			50.3	6.8	8.0	8.0
1	Wayne Poultry Fattener (1933 registra- tion)	Allied Mills, Inc.	15.4	13.5	4.6	4.0			60.9	5.8	7.0	5.5
1	Beacon Broiler Feed	Beacon Milling Co., Inc.	18.0	17.0	4.7	4.0			56.1	4.0	6.0	7.8
1	Beacon Fleshing Mash & Crate Fattener	Beacon Milling Co., Inc.	17.2	15.0	3.2	4.5			62.0	4.9	5.0	4.8
1	Diauto Broiler Ration	Frank Diauto	21.6	19.0	5.5	5.25			52.2	4.8	3.58	8.6
2	Eastern States Fattener Mash	Eastern States Farmers' Exchange	16.9	14.5	5.0	4.5			61.6	4.6	4.5	3.6
1	Just Right Fattening Mash (1933 registration)	Jersee Co.	12.5	10.0	4.8	4.05			65.6	3.9	3.1	2.6
1	Amerikorn Fattener Ration (1933 registration)	Chas. A. Krause Milling Co.	14.5	14.0	5.7	3.5			59.1	3.9	5.0	8.4
1	Larro Poultry Fattening Feed (1933 registration)	Larroe Milling Co.	16.4	14.0	4.3	4.0			62.1	4.9	7.5	2.8
2	Purina Chicken Fatena	Purina Mills	14.8	12.0	5.4	3.0			61.0	6.9	6.6	3.1
	Chick Grains.											
1	Wayne Chick Feed	Allied Mills, Inc.	11.7	9.0	4.4	2.0			71.5	1.9	4.0	1.7
2	Federick Chick Feed	Dietrich & Gambrell, Inc.	11.0	10.0	3.9	2.5			72.3	1.6	3.0	1.8
1	Eshelman Red Rose Chick Grains	John W. Eshelman & Sons	12.0	10.0	4.1	3.0			70.0	1.9	3.0	1.5
1	Grandin's Baby Chick Feed	D. H. Grandin Milling Co.	11.7	10.0	3.1	2.5			71.2	1.5	5.0	1.4
1	Larro Chick Grains	Larroe Milling Co.	10.0	10.0	3.0	2.0			72.6	1.7	4.0	1.4
1	Moore's Baby Chick Grains	Geo. Q. Moore & Co., Inc.	11.6	10.0	1.5	3.0			73.8	1.1	2.5	0.8
1	Park & Pollard Chick Scratch.	Park & Pollard Co.	12.1	10.0	3.2	3.0			70.8	2.0	3.0	1.6
2	Purina Chick Chow (Fine)	Purina Mills	11.9	10.0	3.8	2.0			70.4	2.5	4.0	2.0
	Duck Feeds.											
1	Beacon Senior Duck Grower (1933 registration)	Beacon Milling Co., Inc.	17.2	17.0	4.6	4.5			57.0	4.4	7.0	7.4
1	Beacon Duck Growing Mash (1933 registration)	Beacon Milling Co., Inc.	18.4	17.0	5.1	4.5			56.3	4.9	7.0	8.4

1	Beacon Duck Breeders Mash (1933 registration)	Beacon Milling Co., Inc.	7.9	18.0	17.0	4.6	4.5	57.7	3.9	7.0	7.9
1	Beacon Duck Starter (1933 registration)	Beacon Milling Co., Inc.	9.4	18.2	17.0	4.5	4.5	54.4	5.1	6.0	8.4
1	Beacon Duck Fattener (1933 registration)	Beacon Milling Co., Inc.	9.6	15.6	14.0	5.2	5.0	59.8	3.3	5.5	6.5
<b>Turkey Feeds.</b>											
2	Wayne 25% Turkey Starting Mash (1933 registration)	Allied Mills, Inc.	8.2	26.2	25.0	5.8	4.0	42.5	6.9	8.0	10.4
2	Wayne Turkey Mash (1933 registration)	Allied Mills, Inc.	7.9	18.8	15.0	5.4	3.5	50.6	8.4	8.0	8.9
1	Beacon Turkey Growing Feed	Beacon Milling Co., Inc.	6.9	20.7	18.0	4.5	4.0	52.6	5.0	7.0	10.3
1	D. & G. Turkey Mash (1933 registration)	Dietrich & Gambrell, Inc.	8.3	21.6	20.0	6.2	4.0	43.3	8.6	12.0	12.0
1	Eastern States Turkey Starter (1933 registration)	Eastern States Farmers' Exchange	7.8	25.4	24.0	7.4	4.5	44.9	4.1	5.0	10.4
1	Eastern States Turkey-Grow	Eastern States Farmers' Exchange	8.2	21.1	20.0	5.7	4.0	51.5	4.5	5.0	9.0
4	Eastern States Turkey-Fat	Eastern States Farmers' Exchange	8.5	17.3	16.0	4.7	3.5	57.4	4.8	5.0	7.3
1	Elmore Turkey Growing Mash	Elmore Milling Co., Inc.	7.6	21.2	20.0	6.2	3.5	50.1	6.7	8.0	8.2
1	Larroe Turkey Grower (1933 registration)	Larroe Milling Co.	6.0	25.8	24.5	5.2	4.0	48.7	5.5	6.5	8.8
1	Park & Pollard Turkey Grower (1933 registration)	Park & Pollard Co.	9.3	18.4	15.0	4.8	3.0	55.9	5.4	7.0	6.2
2	Purina Turkey Growing and Fattening Chow	Purina Mills	8.5	23.0	21.0	5.4	3.5	49.6	5.9	8.0	7.6
1	Wirthmore Turkey Fattening Ration	St. Albans Grain Co.	7.6	19.0	16.0	5.1	4.5	54.7	7.0	7.0	6.6
1	Blue Seal Turkey Growing	H. K. Webster Co.	6.6	20.0	20.0	5.3	4.5	53.2	5.3	5.5	9.6
<b>Rabbit Feeds.</b>											
1	Beacon Compress Rabbit Feed.	Beacon Milling Co., Inc.	10.4	18.8	16.5	3.8	4.0	55.2	5.9	7.0	5.9
1	Coweco Rabbit Mash.	E. A. Cowee Co.	9.6	17.3	15.0	4.7	3.5	54.7	7.4	10.0	6.3
1	D. & G. Rabbit Feed	Dietrich & Gambrell, Inc.	10.6	16.7	14.0	4.0	5.0	52.1	7.6	7.0	9.0
4	Eshelman Red Rose Rabbit Feed	John W. Eshelman & Sons	8.6	15.1	14.0	4.2	3.5	60.1	6.0	9.5	6.0
2	B B Rabbit Feed (Pellets)	Maritime Milling Co., Inc.	8.7	17.1	12.0	4.6	2.5	56.7	6.3	12.0	6.6
1	Wirthmore Rabbit Ration.	St. Albans Grain Co.	9.7	16.0	14.0	4.5	3.5	56.0	8.7	9.0	5.1

## Complete Average Analyses of Feeds Collected (Per Cent) — Concluded.

## IV. ANIMAL PRODUCTS

Number of Samples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Protein.		Fat.		Phos-phoric Acid.	Ash.
			Found.	Guar-anteed.	Found.	Guar-anteed.		
3	Meat.							
1	Corenco 60% Meat Scrap	Consolidated Rendering Co.	60.5	60.0	10.8	6.0	7.0	17.4
2	Corenco 55% Meat Scrap	Consolidated Rendering Co.	55.9	55.0	8.0	6.0	10.0	26.1
1	Corenco 50% Meat Scrap	Consolidated Rendering Co.	53.1	50.0	11.5	6.0	9.6	26.0
1	Corenco Meat & Bone Scrap	Consolidated Rendering Co.	54.7	45.0	10.7	6.0	8.4	24.2
1	Meat and Bone Scraps	W. D. Higgins Co.	47.6	45.0	17.8	12.0	9.9	26.8
2	Morse's 55% Meat Scraps	Jas. F. Morse & Co.	55.9	55.0	7.3	8.0	23.0	
1	Moran	Monti-Van Iderstine, Inc.	55.7	50.0	10.8	7.0	9.1	24.5
1	Brighton 60% Meat Scrap	New England Rendering Co.	60.7	60.0	12.1	10.0	5.6	16.2
2	60% Register Brand Meat Scraps	John Reardon & Sons Co.	57.1	60.0	9.7	6.0	9.6	24.7
1	55% Register Brand Meat Scraps	John Reardon & Sons Co.	56.6	55.0	11.0	6.0	9.3	25.4
3	Steamed Meat and Bone	N. Roy & Son	56.2	50.0	10.5	8.0	9.4	24.9
2	Wilpaco Pure Cooked Meat Scraps	Wilmington Packing Co.	51.7	55.0	11.7	8.0	3.3	11.8
1								
<b>Meat and Bone.</b>								
7	Corenco 45% Meat & Bone Scrap	Consolidated Rendering Co.	46.7	45.0	9.6	6.0	13.6	34.5
2	Morse's 50% Meat Scraps	Jas. F. Morse & Co.	51.6	50.0	11.1	8.0	11.1	28.8
4	Morse's 45% Meat Scraps	Jas. F. Morse & Co.	45.9	45.0	10.0	8.0	13.3	34.2
2	Brighton Bull Meat Scrap	New England Rendering Co.	51.2	45.0	10.9	8.0	10.8	28.8
2	50% Register Brand Meat & Bone Scraps.	John Reardon & Sons Co.	51.4	50.0	10.1	6.0	11.8	30.5
7	45% Register Brand Meat & Bone Scraps.	John Reardon & Sons Co.	45.3	45.0	11.4	6.0	13.3	35.1
1	Red "W" Brand Meat & Bone Scraps	Wilson & Co., Inc.	51.5	50.0	12.8	6.0	11.7	29.7
<b>Bone Meal.</b>								
4	Corenco Bone Meal	Consolidated Rendering Co.	24.3	20.0	5.6	2.0	24.4	59.5
1	Rearco Bone Meal for Feed	John Reardon & Sons Co.	25.9	20.0	2.2	3.0	25.2	63.0
1	Vico Special Steamed Bone Meal.	Van Iderstine Co.	13.0	5.0	4.6	0.5	30.9	74.4

Fish.		Consolidated Rendering Co.		Milk Products.	
1	Corenco Cod and Haddock Meal	.	.		
1	Maine White Fish Meal	.	.		
3	Maine Sardine Fish Meal (1933 registration)	.	.		
1	Morse's Fish Meal for Poultry	.	.		
1	*Manamar	.	.		
1	Register Brand Cod and Haddock Fish Meal	.	.		
4	Ro-Be Fish Meal	.	.		
5					
					Milk Sugar by Difference
		62.6	62.0	3.1	2.0
		62.3	60.0	4.8	1.0
		56.3	55.0	18.1	1.0
		67.0	55.0	3.5	3.0
		42.6	40.0	5.8	3.0
		66.1	60.0	3.8	3.0
		57.9	55.0	8.3	5.0
		33.4	32.0	1.1	0.75
		35.5	31.0	1.0	0.2
		32.9	34.0	1.2	1.0
		35.0	33.0	1.0	0.5
		34.3	32.0	6.0	6.0
		34.5	32.0	1.1	0.5
		36.3	30.0	1.0	0.5
		32.1	32.0	1.0	0.5
		34.5	32.0	1.2	1.0
		35.9	32.0	1.1	0.2

\*Fish, kelp and calcium carbonate.

**Summary of Analyses**  
**Season of 1933-1934**

	Samples.	Brands.	Manu- facturers.
<b>Alfalfa Products</b>			
Alfalfa Meal . . . . .	39	14	7
Alfalfa Leaf Meal . . . . .	8	4	4
<b>Animal and Fish Products</b>			
Bone Meal . . . . .	6	3	3
Fish Meal . . . . .	16	7	6
Meat Scrap . . . . .	20	12	9
Meat and Bone Scrap . . . . .	25	7	5
Milk Powders . . . . .	29	10	10
<b>Brewers and Distillers By-Products</b>			
Brewers Grains . . . . .	11	4	4
Distillers Grains . . . . .	2	2	2
<b>Cereal Meals</b>			
Barley Meal . . . . .	3	—	—
Corn Meal . . . . .	43	—	—
Ground Oats . . . . .	61	—	—
Feeding Oatmeal . . . . .	25	11	9
Provender (Corn and Oats) . . . . .	27	—	—
<b>Corn Products</b>			
Gluten Feed . . . . .	47	9	7
Gluten Meal . . . . .	22	4	4
Hominy Feed . . . . .	43	13	11
<b>Miscellaneous Mill Residues</b>			
Barley Flour . . . . .	2	1	1
Beet Pulp . . . . .	9	2	1
Oat Feed . . . . .	8	2	1
Rye Feed . . . . .	8	1	1
Unclassified . . . . .	10	4	4
<b>Oil Cake Meals</b>			
Soy Bean Meal . . . . .	11	4	4
Cottonseed Meal . . . . .	59	14	10
Linseed Meal . . . . .	26	9	7
<b>Wheat Products</b>			
Red Dog Flour . . . . .	7	5	5
Wheat Flour Middlings . . . . .	10	7	7
Wheat Standard Middlings . . . . .	28	15	14
Wheat Mixed Feed . . . . .	62	21	20
Wheat Bran . . . . .	64	28	27
<b>Mixtures for Animals</b>			
Calf Meals . . . . .	11	8	8
Dairy Feeds . . . . .	373	170	60
Fitting Rations . . . . .	19	7	6
Hog Feeds . . . . .	3	2	2
Molasses Feeds . . . . .	64	30	25
Rabbit Feeds . . . . .	10	6	6
Stock Feeds . . . . .	58	28	22
<b>Mixtures for Poultry</b>			
Chick Growing and Starting Feeds . . . . .	103	71	39
Chick Scratch Feeds . . . . .	10	8	8
Duck Feeds . . . . .	5	5	1
Fattening Feeds . . . . .	14	10	8
Laying Feeds . . . . .	221	110	69
Turkey Feeds . . . . .	19	13	10
Totals . . . . .	1641	681	—

## Feeds Not Conforming to Guarantees.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
3	1	<b>Allied Mills, Inc.</b> Brewers Dried Grains . . . . .	—	1.4	—
2	1	<b>A. P. Ames Co.</b> Ames Egg Mash with Cod Liver Oil. . . .	—	—	1.4
6	1	<b>Ashcraft-Wilkinson Co.</b> Helmet Brand Prime Cottonseed Meal . . .	—	—	3.2
1	1	<b>Beacon Milling Co., Inc.</b> Beacon Fleshing Mash & Crate Fattener. . .	—	1.3	—
2	1	<b>Borden Grain Co.</b> Borden's Laying Mash . . . . .	2.1	—	—
2	1	<b>A. B. Caple Co.</b> Alfalfa Leaf Meal . . . . .	1.7	—	1.8
2	1	<b>Center Milk Products Co.</b> Vita-Brand Dried Skim Milk . . . . .	1.3	—	—
7	2	<b>Consolidated Rendering Co.</b> { Corenco 45% Meat and Bone Scrap . . . { Corenco 45% Meat and Bone Scrap . . .	1.1 1.1	— —	— —
2	1	<b>E. A. Cowee Co.</b> Coweco Lo-Price 20% Dairy Ration . . . .	—	—	1.9
1	1	Coweco Stock Feed . . . . .	—	—	2.4
1	1	Harold Tompkins' Special Poultry Mash. . .	—	—	1.5
1	1	<b>Curley Brothers</b> Premier Stock Feed . . . . .	—	1.5	—
3	2	<b>Delaware Mills, Inc.</b> { Delaware White Stock Feed . . . . . { Delaware White Stock Feed . . . . .	— —	— —	1.7 3.0
2	2	{ Indian Sweet 20% Dairy Feed . . . . . { Indian Sweet 20% Dairy Feed . . . . .	— —	— —	1.5 1.6
1	1	<b>Frank Diauto</b> Diauto Broiler Ration . . . . .	—	—	1.2
1	1	Diauto Chick Starter . . . . .	—	—	1.2
2	1	<b>Dietrich &amp; Gambrill, Inc.</b> D. & G. Dairy Feed . . . . .	1.1	—	—
1	1	D. & G. Wheat Mixed Feed . . . . .	—	—	1.4
2	1	Gambrill's 16% Dairy Feed . . . . .	—	—	2.4
1	1	<b>J. L. Dunnell &amp; Son</b> Full Value Mixed Feed . . . . .	—	—	2.1
3	1	<b>Eastern Grain Co.</b> Eastern 24% Dairy Ration Sweetened . . .	—	—	1.1
2	1	<b>Eastern States Farmers' Exchange</b> Eastern States 41% Cottonseed Meal, Choice	1.7	—	—
2	1	<b>Elmore Milling Co., Inc.</b> Elmore Sweet Digesto Dairy Feed . . . .	—	—	2.2
4	2	{ Granger 24% Dairy Ration . . . . . { Granger 24% Dairy Ration . . . . .	1.6 —	— —	— 1.4
8	3	{ Granger 20% Dairy Ration . . . . . { Granger 20% Dairy Ration . . . . . { Granger 20% Dairy Ration . . . . .	— — —	— — —	1.3 1.8 1.3
2	1	<b>John W. Eshelman &amp; Sons</b> Eshelman Golden Rod 25 Dairy Feed . . .	1.3	—	—

## Feeds Not Conforming to Guarantees — Continued.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
2	1	<b>Farm Service Stores, Inc.</b>			
1	1	New England Dairy Ration . . . . .	—	—	2.3
		Quality Stock Feed . . . . .	—	—	1.2
3	2	<b>Fernando Valley Milling &amp; Supply Co.</b>			
		{ Fernando Alfalfa Meal Fine Ground . . . . .	—	—	3.4
5	4	{ Fernando Alfalfa Meal Fine Ground . . . . .	1.9	—	7.9
		{ Fernando Ideal Greens Suncured . . . . .	—	—	2.8
		{ Fernando Ideal Greens Suncured . . . . .	—	—	4.0
		{ Fernando Ideal Greens Suncured . . . . .	—	—	3.0
		{ Fernando Ideal Greens Suncured . . . . .	—	—	2.4
2	1	<b>Flory Milling Co., Inc.</b>			
2	1	Flory's Egg Mash . . . . .	—	—	1.6
		Record Dairy Feed . . . . .	—	1.1	—
5	1	<b>J. B. Garland &amp; Son</b>			
		Garland's 24% Ration . . . . .	1.5	—	—
16	3	<b>Humphreys-Godwin Co.</b>			
		{ Dixie Brand 41% Protein Prime Cottonseed Meal . . . . .	1.9	—	—
		{ Dixie Brand 41% Protein Prime Cottonseed Meal . . . . .	—	—	1.6
		{ Dixie Brand 41% Protein Prime Cottonseed Meal . . . . .	1.7	—	—
2	1	<b>Jaquith &amp; Co.</b>			
		Jaquith & Co. Dairy Ration . . . . .	1.3	—	—
1	1	<b>Jersee Co.</b>			
		Just Right Egg Mash . . . . .	—	—	1.4
9	2	<b>L. B. Lovitt &amp; Co.</b>			
		{ Lovit Brand 41% Cottonseed Meal . . . . .	—	—	2.8
		{ Lovit Brand 41% Cottonseed Meal . . . . .	—	—	2.3
1	1	<b>Maritime Milling Co., Inc.</b>			
		B B Hi-Test Stock Feed Sweetened . . . . .	1.6	—	—
1	1	<b>Geo. Q. Moon &amp; Co., Inc.</b>			
10	2	{ Moon's Baby Chick Grains . . . . .	—	1.5	—
		{ Moon's 20% Dairy Feed with Molasses . . . . .	—	—	2.9
		{ Moon's 20% Dairy Feed with Molasses . . . . .	—	—	1.5
2	1	Moon's Growing Mash . . . . .	1.2	—	—
2	1	Moon's Stock Feed . . . . .	—	—	1.7
4	1	<b>James F. Morse &amp; Co.</b>			
		Morse's 45% Meat Scrap . . . . .	2.9	—	—
2	1	<b>New England Rendering Co.</b>			
		Brighton 60% Meat Scraps . . . . .	4.0	—	—
2	2	<b>Ogden Grain Co.</b>			
		{ 24% Thrift Dairy Ration . . . . .	1.1	—	—
		{ 24% Thrift Dairy Ration . . . . .	1.7	—	—
3	2	<b>Ogilvie Flour Mills Co., Ltd.</b>			
		{ Ogilvie's Wheat Bran . . . . .	—	—	1.1
		{ Ogilvie's Wheat Bran . . . . .	—	—	1.3
2	1	<b>Park &amp; Pollard Co.</b>			
		Manamar Complete Ration . . . . .	—	—	1.9
2	1	<b>George H. Parker Grain Co.</b>			
		Parker's Special Dairy Ration . . . . .	—	—	1.1

## Feeds Not Conforming to Guarantees — Concluded.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
3	1	<b>Pecos Valley Alfalfa Mill Co.</b>			
2	1	Peevee Alfalfa Leaf Meal . . . . .	—	—	1.5
	1	Velvet Meal . . . . .	2.6	—	1.2
4	4	<b>Quaker Oats Co.</b>			
		{ Banner Feed . . . . .	1.5	—	—
		{ Banner Feed . . . . .	—	—	2.1
		{ Banner Feed . . . . .	—	—	1.9
		{ Banner Feed . . . . .	—	—	1.4
1	1	Quaker Sugared Schumacher . . . . .	—	—	1.1
5	1	Vim Feed . . . . .	—	—	4.0
1	1	<b>John Reardon &amp; Sons Co.</b>			
7	1	60 % Register Brand Meat Scraps . . . . .	2.9	—	—
	1	45 % Register Brand Meat and Bone Scraps . . . . .	2.5	—	—
8	1	<b>Russell-Miller Milling Co.</b>			
		Hard Wheat Occident Mixed Feed . . . . .	—	—	1.3
9	1	<b>St. Albans Grain Co.</b>			
4	1	Utility Dairy Ration . . . . .	—	—	1.7
2	2	Utility Pasture Ration . . . . .	—	—	1.9
		{ Wirthmore Stock Feed . . . . .	—	—	1.4
		{ Wirthmore Stock Feed . . . . .	—	—	1.8
3	1	<b>F. W. Stock &amp; Sons</b>			
		Litchfield Mixed Feed . . . . .	—	—	1.5
4	1	<b>Stratton &amp; Co.</b>			
		Stratton's Mixed Feed . . . . .	—	—	2.1
7	1	<b>Transit Milling Co.</b>			
		Texas Bull Brand Cottonseed Meal, 41 % Protein . . . . .	1.7	—	—
6	6	<b>United Milling Corp.</b>			
		{ Sunshine Leaf Meal . . . . .	1.6	—	1.7
		{ Sunshine Leaf Meal . . . . .	—	—	2.8
		{ Sunshine Leaf Meal . . . . .	1.9	—	5.6
		{ Sunshine Leaf Meal . . . . .	2.1	—	5.4
		{ Sunshine Leaf Meal . . . . .	—	—	5.9
		{ Sunshine Leaf Meal . . . . .	—	—	2.1
3	1	<b>C. P. Washburn Co.</b>			
		"Made Right" Starting & Growing Feed . . . . .	—	—	1.2
2	1	<b>H. K. Webster Co.</b>			
2	1	Blue Seal Growing Mash with Cod Liver Oil . . . . .	—	—	1.1
	1	Blue Seal Special 20 % Dairy Ration . . . . .	—	—	1.2
2	1	<b>West-Nesbitt, Inc.</b>			
3	2	Pure Feed Horse Ration . . . . .	—	—	2.2
		{ Special 20 % Dairy Ration . . . . .	—	—	1.4
		{ Special 20 % Dairy Ration . . . . .	—	—	1.7
1	1	<b>Wilmington Packing Co.</b>			
		Wilpaco Pure Cooked Meat Scraps . . . . .	3.3	—	—
1	1	<b>Est. M. G. Williams</b>			
		Williams' Stock Feed . . . . .	—	—	1.2



**Certified Ingredients****Allied Mills, Inc.****Empire 20% Dairy Ration**

Corn distillers' dried grains, brewers' dried grains, soybean oil meal, corn gluten feed, corn gluten meal, cottonseed oil meal, corn meal, wheat bran, ground and bolted screenings from flax, wheat, corn, oats and barley, clipped oat by-products, cane molasses, 1 % ground limestone and 1 % salt.

**Empire Egg Mash**

Dried buttermilk, dried skim milk, meat scraps, soybean oil meal, choice alfalfa meal, wheat bran, wheat standard middlings, corn meal, fine ground oats, 1 % ground limestone and 1 % salt.

**Empire Egg Mash with Sardine Oil**

Dried buttermilk, dried skim milk, meat scraps, soybean oil meal, choice alfalfa meal, wheat bran, wheat standard middlings, corn meal, fine ground oats, 1 % ground limestone, 1 % salt and sardine oil.

**Wayne Amco 20% Dairy Ration**

Cottonseed oil meal, brewers' dried grains, corn distillers' dried grains, ground oats, corn gluten feed, corn meal, soybean oil meal, corn gluten meal, old process linseed oil meal, wheat bran, cane molasses, 1 % steamed bone meal, 1 % ground limestone and 1 % salt.

**Wayne Breeder Mash**

Fish meal, meat scraps, dried buttermilk, dried skim milk, soybean oil meal, choice alfalfa meal, wheat bran, corn meal, corn germ oil meal, wheat standard middlings, fine ground oats, crab meal, 2 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide, 0.25 % salt and sardine oil.

**Wayne Egg Mash**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, wheat bran, corn meal, fine ground oat meal, corn gluten feed, choice alfalfa meal, soybean oil meal, fine ground oats, 2 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide and 0.25 % salt.

**Wayne Mash Concentrate**

Dried buttermilk, dried skim milk, fish meal, peanut oil meal, meat scraps, soybean oil meal, corn gluten meal, corn gluten feed, choice alfalfa meal, 4 % ground limestone, 0.15 % iron oxide, 0.002 % potassium iodide and 0.5 % salt.

**Wayne 20% National Dairy Ration**

Corn gluten feed, cottonseed oil meal, wheat bran, corn meal, ground oats, corn distillers' dried grains, soybean oil meal, old process linseed oil meal, cane molasses, 1 % steamed bone meal, 1 % ground limestone and 1 % salt.

**A. P. Ames Co.****Ames Egg Mash with Cod Liver Oil**

Dried milk, corn meal, wheat bran, wheat middlings, ground oat groats, meat scraps, fish meal, alfalfa meal, calcium carbonate, salt and cod liver oil.

**Ames Growing Mash, with and without Cod Liver Oil**

Dried milk, oat meal, ground oats, corn meal, wheat bran, wheat middlings, meat scraps, fish meal, alfalfa meal, calcium carbonate, salt.

**20 % Balanced Ration**

Corn meal, hominy, wheat bran, wheat middlings, reground oat feed with molasses, gluten feed, linseed meal, cottonseed meal, calcium carbonate, salt, bone meal.

**Anchor Mills****Zip Egg Mash**

Buttermilk, fishmeal, meat scrap, bonemeal, soybean meal, corn gluten feed, ground oats, alfalfa meal, wheat bran, standard wheat middlings, cornmeal, calcium carbonate, salt.

**Arcady Farms Milling Co.****Arcady Besbet Laying Mash**

Fish meal, meat scraps, animal liver meal, soy bean meal, corn gluten meal, dried buttermilk, o. p. linseed oil meal, oat meal, corn meal, corn gluten feed, alfalfa meal, fine ground oats, wheat bran, wheat middlings, cod liver oil, bone meal, 1 % calcium carbonate from limestone, 1/2 of 1 % salt.

**Arcady 24% Open Formula Production Ration**

Wheat bran, hominy feed, o. p. linseed oil meal, ground oats, corn gluten feed, cottonseed meal, corn gluten meal, cane molasses, bone meal, 1 % calcium carbonate from limestone, 1 % salt.

**Arcady 20% Open Formula Production Ration**

Wheat bran, hominy feed, o. p. linseed oil meal, ground oats, corn gluten feed, cottonseed meal, corn gluten meal, cane molasses, bone meal, 1 % calcium carbonate from limestone, 1 % salt.

**Old Colony Feed**

Cottonseed meal, soy bean meal, hominy feed, corn gluten feed, o. p. linseed oil meal, distillers' dried grains from corn, dried beet pulp, wheat bran, wheat middlings, 1 % calcium carbonate from limestone, 1/2 of 1 % salt.

**Peerless Milk Ration**

Cottonseed meal, soy bean meal, corn gluten meal, o. p. linseed oil meal, corn gluten feed, wheat bran, distillers dried grains from corn, dried grains from barley, malt and corn, cleaned ground and bolted wheat screenings, ground and bolted clipped oat by-product, molasses, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

E. W. Bailey & Co.

**Capital Dairy Ration**

Corn gluten feed, linseed oil meal, hominy feed, 43% cottonseed meal, ground oats, wheat bran, corn meal, edible bone meal, calcium carbonate and fine salt.

**Sweetened Favorite Dairy Ration**

White hominy feed, cottonseed meal, linseed oil meal, corn meal, ground oats, wheat bran, corn gluten feed, wheat middlings, edible bone meal, calcium carbonate, fine salt and molasses.

Barber & Bennett, Inc.

**Double Value 20% Dairy**

Corn gluten feed, cottonseed meal — choice, wheat bran (may contain mill run screenings), hominy feed and corn meal, corn distillers' dried grains, soybean oil meal, coconut oil meal, molasses — cane, bone meal — steamed, salt.

**Double Value Growing Mash**

Wheat bran (may contain mill run screenings), wheat flour middlings, corn meal, fine ground low fiber oats, alfalfa meal — low fiber, meat scraps — 55%, fish meal, salt, cod liver oil reinforced in vitamin D.

Beacon Milling Co., Inc.

**Auburn Dairy Feed**

Corn gluten feed, old process linseed oil meal, soy bean oil meal, ground oats, corn meal, ground grain screenings, cottonseed meal, wheat bran, ground barley, brewer's dried grains, corn distiller's dried grains, molasses, 1% salt, 1% calcium carbonate, 1% calcium phosphate.

**Beacon Breeders Mash with Buttermilk**

Dried skimmilk, dried buttermilk, meat scrap, fish meal, alfalfa leaf meal, corn meal, pulverized heavy oats, pulverized heavy barley, corn gluten meal, wheat bran, wheat middlings, soy bean oil meal, old process linseed oil meal, anti-rachitic oil,  $\frac{1}{2}$ % fine salt, 3% calcium carbonate, 1% calcium phosphate, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals.) (Wheat bran or middlings may contain mill run screenings.)

**Beacon Broiler Feed**

Dried skimmilk, meat scrap, fish meal, ground corn, pulverized heavy oats, pulverized heavy barley, wheat bran (may contain mill run screenings), soy bean oil meal, wheat red dog, alfalfa leaf meal, anti-rachitic oil,  $\frac{1}{2}$ % salt, 2% calcium carbonate, 1% calcium phosphate.

**Beacon's Cayuga Growing Mash**

Dried skimmilk, fish meal, meat scraps, old process linseed oil meal, soy bean oil meal, pulverized heavy oats, corn meal, pulverized heavy barley, wheat bran, wheat middlings, alfalfa leaf meal, anti-rachitic oil, 3% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}$ % salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon's Cayuga Laying Mash with Buttermilk**

Dried buttermilk, dried skimmilk, fish meal, meat scrap, corn meal, alfalfa leaf meal, wheat bran, wheat middlings, soy bean oil meal, pulverized heavy barley, corn gluten meal, pulverized heavy oats, anti-rachitic oil, 3% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}$ % salt (Wheat bran or middlings may contain mill run screenings.)

**Beacon's Chariot Starter and Grower Containing Cod Liver Oil**

Dried skimmilk, fish meal, meat scrap, old process linseed oil meal, pulverized heavy oats, corn meal, pulverized barley, wheat bran, wheat middlings, alfalfa leaf meal, 2% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}$ % salt.

**Beacon Complete Starting Ration**

Dried skimmilk, meat scrap, fish meal, ground corn, ground hulled oats, pulverized heavy oats, pulverized heavy barley, wheat bran (may contain mill run screenings), old process linseed oil meal, wheat red dog flour, alfalfa leaf meal, anti-rachitic oil,  $2\frac{1}{2}$ % calcium carbonate,  $\frac{3}{4}$ % calcium phosphate,  $\frac{1}{2}$ % salt.

**Beacon Dairy Ration**

Old process linseed oil meal, soy bean oil meal, corn gluten feed, corn distiller's dried grains, ground barley, corn gluten meal, hominy feed, corn meal, cottonseed meal, alfalfa meal, wheat bran, wheat middlings, 1% calcium carbonate, 1% calcium phosphate, 1% salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon Egg Mash with Buttermilk**

Dried buttermilk, dried skimmilk, meat scrap, fish meal, corn gluten meal, soy bean oil meal, old process linseed oil meal, pulverized heavy barley, pulverized heavy oats, corn meal, alfalfa leaf meal, wheat bran, wheat middlings, anti-rachitic oil, 3% calcium carbonate, 1% calcium phosphate,  $\frac{1}{2}$ % fine salt, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals.) (Wheat bran or middlings may contain mill run screenings.)

**Beacon Fleshing Mash and Crate Fattener**

Dried skimmilk, pulverized heavy oats, ground oat groats, pulverized heavy barley, wheat low grade flour, corn meal, corn oil meal, rolled oats, old process linseed oil meal, anti-rachitic oil,  $1\frac{1}{2}$ % calcium carbonate,  $\frac{1}{2}$ % calcium phosphate, 1% salt.

**Beacon Growing Mash**

Dried skim milk, meat scrap, fish meal, old process linseed oil meal, soy bean oil meal, pulverized heavy oats, pulverized heavy barley, corn meal, wheat red dog, alfalfa leaf meal, wheat bran, wheat middlings, anti-rachitic oil, 3% calcium carbonate, 1% calcium phosphate, ½% salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon Sweet "24"**

Old process linseed oil meal, soy bean oil meal, corn gluten meal, cottonseed meal, corn gluten feed, corn meal, brewer's dried grains, corn distiller's dried grains, wheat bran (may contain mill run screenings), ground oats, ground barley, molasses, 1% salt, 1% calcium carbonate.

**Beacon "20"**

Old process linseed oil meal, cottonseed meal, soy bean oil meal, corn gluten feed, corn gluten meal, corn meal, wheat bran (may contain mill run screenings), corn distiller's dried grains, ground oats, ground barley, 1% salt, 1% calcium phosphate, 1% calcium carbonate.

**Beacon Sweet "20"**

Old process linseed oil meal, soy bean oil meal, corn distiller's dried grains, cottonseed meal, wheat bran, wheat middlings, brewer's dried grains, corn gluten meal, corn gluten feed, ground barley, corn meal, ground oats, molasses, 1% calcium carbonate, 1% salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon Turkey Growing Feed**

Dried skim milk, alfalfa leaf meal, old process linseed oil meal, soy bean oil meal, meat scrap, fish meal, wheat bran, wheat middlings, wheat red dog flour, pulverized heavy oats, pulverized heavy barley, corn meal, anti-rachitic oil, 3% calcium carbonate, 1% calcium phosphate ½% salt, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals.) (Wheat bran or middlings may contain mill run screenings.)

**Berkshire Coal and Grain Co., Inc.****Berkshire Hills Sweet Dairy Feed**

Wheat bran, cottonseed meal, rye midds, corn gluten feed, linseed oil meal, corn meal, ground oats, calcium carbonate, molasses and salt.

**Green Mountain Dairy Ration**

Wheat bran, cottonseed meal, corn gluten feed, linseed oil meal, corn meal, ground oats and barley, calcium carbonate, salt.

**Green Mountain Laying Mash**

Wheat bran, wheat middlings, linseed oil meal, corn meal, fine ground oats, alfalfa meal, meat scraps, bone meal, fish meal, dried skim milk, calcium carbonate, salt, tested cod liver oil.

**Black Rock Milling Corp.****Bidwell 20% Dairy Ration**

Wheat bran, linseed oil meal, malt sprouts, gluten feed, gluten meal, ground barley, cottonseed meal, fine ground grain screenings, molasses, calcium carbonate and salt.

**Bidwell Dry-Mash**

Dried buttermilk, alfalfa meal, corn meal, wheat bran, wheat middlings, fish meal, meat, bone, linseed oil meal, gluten meal, soy bean meal, calcium carbonate, salt and ground: wheat, barley, kaffir corn and buckwheat.

**Bidwell Dry-Mash with Cod Liver Oil**

Dried buttermilk, vitamin tested cod liver oil, alfalfa meal, corn meal, wheat bran, wheat middlings, fish meal, meat, bone, linseed oil meal, gluten meal, soy bean meal, calcium carbonate, salt and ground: wheat, barley, kaffir corn and buckwheat.

**Borden Grain Co.****Borden's Dairy Feed**

Wheat bran, wheat middlings, corn meal or hominy, gluten meal, cotton seed meal, gluten feed, linseed oil meal, calcium carbonate, bonemeal, salt.

**Borden's Laying Mash**

Corn meal, wheat bran, wheat middlings, ground oatmeal, dried milk, cod liver oil, alfalfa leaf meal, fish meal, meat scrap, calcium carbonate, salt.

**George B. Brown****Brown's Dairy Feed**

Wheat bran, hominy feed, oat feed, cotton seed meal, calcium carbonate, corn meal, o. p. linseed meal, corn gluten feed, molasses, bone meal and salt.

**Brown's Egg Mash**

Corn meal, wheat midds, ground oats, wheat bran, meat scraps, bone meal, dried milk, leaf alfalfa meal, charcoal, calcium carbonate, salt, cod liver oil.

**Coles Co.****Fortune Egg Mash with Dried Buttermilk**

Ground corn, wheat, oats, barley, kaffir corn, buckwheat, alfalfa, wheat bran, wheat flour midds, old process linseed meal, corn gluten feed, corn germ meal, hominy, dried buttermilk, fish meal, bone and meat meal, calcium carbonate, 1% salt. (Wheat bran and wheat middlings may contain screenings not to exceed mill run.)

## Community Feed Stores, Inc.

**Community Chick Mash (Starter-Grower-Broiler)**

Hominy or corn meal, pulverized oats, bran, middlings, red dog middlings, beef scraps, alfalfa meal, dried milk, bone meal, cod liver meal, cod liver oil, fish meal, salt.

**Community-20 Dairy Ration**

Corn distillers dried grains, cottonseed meal 41%, linseed meal, gluten feed, hominy or corn meal, ground oats, bran, middlings, molasses, calcium carbonate, salt.

**Community Milk Laying Mash**

Yellow hominy or corn meal, ground oats, bran, gluten feed, middlings, meat scraps, dried milk, alfalfa meal, salt, calcium carbonate, cod liver meal, cod liver oil.

**Hilltop-20 Dairy Ration**

Cottonseed meal 41%, linseed meal, gluten feed, hominy or corn meal, Vim Feed (oat feed), bran, middlings, calcium carbonate, salt, molasses.

## Nicolas Courcy Grain Co.

**Courcy's Dairy Feed**

Bran, middlings, Buffalo gluten, Diamond gluten, 41% cottonseed, 34% linseed, meal or hominy, salt, calcite flour.

**Courcy's Eastern Laying Mash**

Meal, wheat bran, wheat middlings, feeding oat meal, alfalfa leaf meal, dry skim milk, 50% scrap, fish meal, bone meal, fine salt, calcite flour, with 1% cod liver oil or without.

**Courcy's Growing Feed**

Wheat bran, middlings, yellow corn meal, feeding oat meal, 50% scraps, linseed oil meal, bone meal, fish meal, calcite flour, leaf meal, milk, salt, with 1% cod liver oil or without.

**Eastern Starting Feed**

Wheat bran, wheat middlings, yellow corn meal, feeding oat meal, bone meal, dry skim milk, leaf meal, fish meal, 60% scraps, cracked wheat, hulled oats, fine salt, calcite flour, with 1% cod liver oil or without.

## Cover &amp; Palm Co.

**The Perfect Dry Mash**

Alfalfa meal, hominy feed, corn meal, wheat bran, wheat middlings, gluten feed, linseed meal, meat scraps, ground oats, kaffir corn meal, salt, dried skim milk, calcium carbonate.

## E. A. Cowee Co.

**Coweco Growing Mash**

Wheat bran, wheat middlings, corn meal, oat meal, soya bean meal, alfalfa leaf meal, meat scraps, fish meal, dried milk, edible bone meal, calcium carbonate, salt, with or without cane molasses, with or without cod liver oil.

**Coweco Laying Mash**

Wheat bran, wheat middlings, oat meal, gluten feed, soya bean meal, linseed oil meal, meat scraps, fish meal, corn meal, dried milk, alfalfa leaf meal, edible bone meal, calcium carbonate, salt, with or without cane molasses, with or without cod liver oil.

**Coweco Lo-Price 20% Dairy Ration**

Bran, middlings, ground oats, cottonseed meal, corn meal, gluten meal, linseed meal, ground barley, soya bean meal, cane molasses, bone meal, calcium carbonate and salt.

**Coweco 1925 Ration**

Wheat bran and middlings, corn meal, cottonseed meal, gluten feed, linseed oil meal, hominy, ground oats, distillers' grains, brewers' grains, soya bean meal, edible bone meal, salt, calcium carbonate and molasses.

**Coweco 20% Ration**

Wheat bran and middlings, gluten feed, corn meal, distillers' grains, linseed meal, soya bean meal, ground oats, cottonseed meal, brewers' grains, molasses, edible bone meal, calcium carbonate and salt.

**Coweco Sunrise 20% Dairy Ration**

Wheat bran and middlings, brewers' grains, gluten, distillers' grains, ground cleanings from corn, oats, wheat and barley, cottonseed meal, molasses, calcium carbonate, salt.

**Coweco Sunrise Laying Mash**

Wheat bran, wheat middlings, corn meal, hominy, ground oats, gluten, soya bean meal, meat scraps, alfalfa meal, edible bone meal, calcium carbonate, salt, with or without cod liver oil.

## Curley Brothers

**Crystal All Grain Starting Food**

Pure dry buttermilk, cod liver oil, yellow corn meal, ground oat groats, red dog flour, bran, alfalfa leaf meal, cracked wheat, fine cracked corn, steelcut oatmeal, steamed edible bone meal powdered charcoal, salt, calcium carbonate, white fish meal.

**Crystal 24% Dairy Ration**

Corn gluten meal, corn gluten feed, cottonseed meal, linseed oil meal, distillers grains, hominy feed, ground barley, ground oats, bran and middlings with mill run of screenings, edible bone meal, salt, calcium carbonate.

**Crystal 20% Dairy Ration**

Corn gluten feed, yellow corn meal, hominy feed, bran and middlings with mill run of screenings, cottonseed meal, linseed oil meal, beet pulp, steamed edible bone meal, calcium carbonate, salt.

**Crystal Egg Mash**

Linseed oil meal, yellow hominy feed, yellow corn meal, bran and middlings, with mill run of screenings, feeding oatmeal, red dog, alfalfa poultry greens, meat scraps, fish scraps, steamed bone meal, dried skim milk, salt, calcium carbonate.

**Crystal Growing Mash**

Cod liver oil, dried skim milk, meat scraps, white fish meal, steamed edible bone meal, alfalfa poultry greens, red dog flour, bran and middlings with mill run of screenings, feeding oatmeal, yellow hominy feed, yellow corn meal, calcium carbonate, salt.

**Delaware Mills, Inc.****Delco 24% Dairy Feed**

Linseed oil meal, corn gluten feed, corn gluten meal, peanut oil meal, cottonseed meal, wheat bran (which may contain mill run screenings), wheat middlings, corn meal, phosphatic calcium carbonate, salt.

**Delco 20% Dairy Feed**

Dried beet pulp, linseed oil meal, corn gluten feed, corn gluten meal, peanut oil meal, cottonseed meal, wheat bran, wheat middlings, hominy feed, ground oats, salt, phosphatic calcium carbonate.

**Delco Sweet 20% Dairy Feed**

Cane molasses, linseed oil meal, corn gluten feed, corn gluten meal, cottonseed meal, soya bean oil meal, peanut oil meal, wheat bran, wheat middlings, hominy feed, ground oats, ground barley, phosphatic calcium carbonate, salt.

**Indian Laying Mash (with Dried Skim Milk)**

Dried skim milk, meat scrap, fish meal, bone meal, soya bean oil meal, corn gluten feed, alfalfa meal, wheat bran, wheat middlings, corn meal, ground barley, ground oats, phosphatic calcium carbonate and salt.

**Frank Diauto****Diauto Broiler Ration**

Yellow meal, bran, wheat flour middlings, oat groats, skim milk, alfalfa leaf meal, 60% meat scraps, fish meal 55%, cod liver oil, calcium carbonate, salt.

**Diauto's Chick Starter**

Corn meal, flour middlings, bran, feed oat meal, meat scraps 60%, dried skim milk, fish meal, alfalfa leaf meal, oyster shell meal, salt.

**Diauto's Dairy Feed**

Gluten feed, corn meal, ground oats, bran, linseed meal, cotton seed meal, salt.

**Diauto's Fancy Chick Growing Mash**

Coarse yellow corn meal, wheat bran, wheat flour middlings, ground oats, meat scraps 60%, dried skimmed milk, fish meal 50%, alfalfa leaf meal, ground oyster shells, common salt.

**Diauto's Special Egg Mash with Cod Liver Oil**

Coarse yellow corn meal, wheat bran, wheat flour middlings, ground oats, meat scraps 60%, dried skimmed milk, fish meal 50%, alfalfa leaf meal, ground oyster shells, common salt.

**F. Diehl & Son, Inc.****Diehl's Dairy Feed**

Bran, brewers grains, cottonseed meal, gluten, linseed meal, corn meal, oat meal mill by-products ground barley, pure ground oats, wheat middlings, salt, calcium carbonate, bone meal, sweetened.

**Diehl's Dry Mash**

Alfalfa, Banner Feed, bone, dried milk, charcoal, fish scraps, gluten feed, linseed meal, meat scraps, middlings and red dog.

**Dietrich & Gambrell, Inc.****All Mash Starter & Grower**

Corn meal, oat meal, wheat middlings, alfalfa leaf meal, malt flour, peanut meal, fish meal, dried buttermilk, cod liver oil, bone meal, 1% calcium carbonate, 1% salt.

**D. & G. All Mash Laying Ration**

Wheat middlings, wheat bran, pulverized oats, wheat flour middlings, wheat bran, alfalfa leaf meal, dried milk, fish meal, meat scrap, bone meal, soy bean meal, calcium carbonate, salt.

**D. & G. Dairy Feed**

Cottonseed meal, peanut meal, linseed meal, gluten feed, corn feed meal, wheat bran, ground grain screenings, clipped oat by-products, oat middlings, oat shorts, oat hulls, molasses, 1% bone meal, 1% calcium carbonate, 1% salt.

**Frederick Growing Mash**

Wheat middlings, wheat bran, pulverized oats, corn feed meal, gluten feed, meat scrap, dried buttermilk, alfalfa leaf meal, bone meal, 1% calcium carbonate, 1% salt.

**Frederick Laying Mash**

Wheat bran, wheat middlings, corn feed meal, pulverized oats, gluten meal, meat scrap, fish meal, alfalfa meal, cottonseed meal, bone meal, 1% calcium carbonate, 1% salt, dried buttermilk.



**Gambrill's A. I. Dairy Feed**

Gluten Feed, cottonseed meal, linseed meal, peanut meal, dried brewers grains, wheat bran, corn feed meal, wheat middlings, ground oats, molasses, 1 % calcium carbonate, 1 % bone meal, 1 % salt.

**Gambrill's 16 % Dairy Feed**

Cottonseed meal, peanut meal, gluten feed, wheat bran, corn feed meal, ground grain screenings from wheat, clipped oat by-products, oat middlings, oat shorts, oat hulls, molasses, 1 % bone meal, 1 % calcium carbonate, 1 % salt.

**Pen Mar Dairy Feed**

Gluten feed, cottonseed meal, linseed meal, peanut meal, dried brewers grains, ground oats, corn feed meal, wheat bran, wheat middlings, molasses, 1 % calcium carbonate, 1 % bone meal, 1 % salt.

**Eastern States Farmers' Exchange****Eastern States Combination Mash**

E. S. yellow corn meal — attrition, wheat bran (may contain mill run screenings), wheat flour middlings, E. S. pure ground oats, dry skim milk, alfalfa leaf meal, E. S. meat scraps 50 %, pure fish meal 55 %, oyster shell meal, dicalcium phosphate, sardine oil, salt.

**Eastern States Controller Mash**

Dry skim milk, E. S. yellow corn meal — attrition, wheat bran (may contain mill run screenings), ground oat groats, oyster shell meal, salt, dicalcium phosphate, sardine oil.

**Eastern States Fattener Mash**

E. S. yellow corn meal — attrition, corn oil meal, ground oat groats, dry skim milk, standard middlings, wheat red dog, E. S. pure ground oats, soy bean oil meal, salt.

**Eastern States Fulpail Dairy Ration**

Yellow hominy feed, wheat bran (may contain mill run wheat screenings), distillers' corn dried grains, corn gluten feed, 41 per cent cottonseed meal prime quality, 41 per cent protein soybean oil meal, cane molasses, E. S. ground oats, dicalcium phosphate, salt.

**Eastern States Milkmore Dairy Ration**

41 per cent protein cottonseed meal prime quality, corn gluten feed, wheat bran (may contain mill run wheat screenings), distillers' corn dried grains, 41 per cent protein soybean oil meal, yellow hominy feed, cane molasses, E. S. ground oats, dicalcium phosphate, salt.

**Eastern States Producer 20 (Open Formula)**

E. S. yellow corn meal — attrition, wheat bran (may contain mill run wheat screenings), wheat flour middlings, E. S. meat scraps 50 %, E. S. pure ground oats, alfalfa leaf meal, dry skim milk, pure fish meal 55 %, soy bean oil meal, oyster shell meal, dicalcium phosphate, sardine oil, salt.

**Eastern States Producer Mash**

E. S. yellow corn meal — attrition, wheat bran (may contain mill run screenings), wheat flour middlings, E. S. pure ground oats, E. S. meat scraps 50 %, pure fish meal 55 %, alfalfa leaf meal, dry skim milk, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Eastern States Sixteen Dairy Ration**

Yellow hominy feed, wheat bran (may contain mill run wheat screenings), distillers' corn dried grains, corn gluten feed, cane molasses, E. S. ground oats, 41 per cent protein cottonseed meal prime quality, 41 per cent protein soybean oil meal, dicalcium phosphate, salt.

**Eastern States Starting and Broiler Ration**

E. S. yellow corn meal — attrition, wheat bran (may contain mill run screenings), wheat flour middlings, ground oats groats, dry skim milk, alfalfa leaf meal, E. S. meat scraps 50 %, pure fish meal 55 %, oyster shell meal, salt, sardine oil, dicalcium phosphate.

**Eastern States 32 % Supplement Feed**

E. S. choice cottonseed meal, corn gluten meal, soy bean oil meal, corn distillers' dried grains, molasses, old process linseed oil meal — pure, wheat bran (may contain mill run screenings), dried brewers' grains, dicalcium phosphate, salt.

**Eastern States Turkey-Fat**

E. S. yellow corn meal — attrition, standard wheat bran, wheat flour middlings, ground oat groats, dry skim milk, E. S. meat scraps 50 %, alfalfa leaf meal, oyster shell meal, dicalcium phosphate, salt.

**Eastern States Turkey-Grow**

E. S. yellow corn meal — attrition, wheat bran (may contain mill run screenings), wheat flour middlings, ground oat groats, E. S. meat scraps 50 %, dry skim milk, alfalfa leaf meal, pure fish meal 55 %, sardine oil, oyster shell meal, dicalcium phosphate, salt.

Michael W. Ellis

**The Ellis Dairy Feed**

Corn meal, wheat middlings, wheat bran, gluten meal, hominy feed, gluten feed, corn distillers' grains, cottonseed meal, oil meal, ground oats, calcite flour, salt, edible bone meal. (Wheat feeds may contain screenings not exceeding mill run).

**The Ellis Poultry Mash**

Wheat bran, wheat middlings, hominy feed, gluten feed, corn meal, rolled oats or feeding oat-meal, alfalfa leaf meal, cod liver oil, beef scraps, dried skim milk or buttermilk, edible bone meal, salt, charcoal, calcite flour. (Wheat feeds may contain screenings not exceeding mill run.)

## Elmore Milling Co., Inc.

**Elmore Chixsaver**

Dried skim milk, wheat flour midds, wheat bran, corn meal, alfalfa leaf meal, oat flour, meat and bone meal, fish meal, cod liver oil, fine table salt.

**Elmore Complete Laying Ration**

Meat and bone meal, fish meal, whole oat groats, corn meal, ground wheat, alfalfa leaf meal, wheat bran, wheat middlings, dried skim milk, cod liver oil, calcium carbonate, salt.

**Elmore Egg Mash**

20% Dried buttermilk and meat scraps, 2nd clear wheat flour, pure ground oats, wheat middlings, alfalfa leaf meal, corn meal or hominy feed, wheat bran, cod liver oil, not more than 1% calcium carbonate, salt, fish meal.

**Elmore Growing Mash**

Dried buttermilk, meat meal, bone meal, wheat midds, wheat bran, low grade wheat flour, alfalfa leaf meal, corn meal, oat flake, gluten feed, salt, cod liver oil, fish meal.

**Elmore Milk Grains**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers grains, calcium carbonate, salt, soybean oil meal.

**Elmore Milk Grains Junior**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, calcium carbonate, salt, soybean oil meal.

**Elmore's Sweet Digesto Dairy Feed**

Corn gluten feed, cottonseed meal, wheat bran, coconut oil meal, pulverized wheat screenings, oat meal mill by-products (oat hulls, oat midds and oat shorts), cane molasses, salt.

**Elmore Turkey Growing Mash**

Alfalfa leaf meal, wheat bran, corn meal, wheat middlings, soybean oil meal, meat and bone meal, cod liver oil, dried skim milk,  $\frac{1}{2}$  of 1% salt.

**Emco Feed**

Wheat bran, wheat midds, linseed oil meal, beet pulp, corn gluten feed, corn meal or hominy feed, cotton seed meal, calcium carbonate, salt.

**Granger 24% Dairy Ration**

Wheat bran, wheat middlings, cotton seed meal, ground whole barley, soybean meal, corn gluten feed, cane molasses, reground wheat screenings, calcium carbonate, salt.

**Granger 20% Dairy Ration**

Wheat bran, wheat midds, ground barley, cottonseed meal, corn gluten meal, corn meal or hominy feed, soybean meal, cane molasses, reground wheat screenings, calcium carbonate, salt.

## John W. Eshelman &amp; Sons

**Eshelman Certified 20% Dairy Ration**

Corn gluten feed, choice hominy feed, pure ground 38 lb. No. 2 white clipped oats, 34% o. p. oil meal, standard wheat bran, 41% pro. cottonseed meal, soybean oil meal, standard wheat middlings, corn distillers' dried grains, cane molasses, steamed bone meal, calcium carbonate salt.

**Eshelman Challenge Dairy Feed**

Cottonseed meal, wheat bran, corn gluten feed, cane molasses, corn gluten meal, ground oats, dried brewers grains, corn distillers grains, corn meal, o. p. oil meal, soybean oil meal, reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Conestoga 20 Dairy Feed**

Cottonseed meal, wheat bran, cane molasses, corn gluten feed, dried brewers grains, corn distillers grains, soybean oil meal, o. p. oil meal, reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Golden Rod 25 Dairy Feed**

Cottonseed meal, wheat bran, ground oats, corn gluten feed, dried brewers grains, corn gluten meal, corn meal, corn distillers grains, soybean oil meal, o. p. oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Lancaster 20 Dairy Feed**

Wheat bran, cottonseed meal, ground oats, corn gluten feed, cane molasses, dried brewers grains, corn distillers grains, corn meal, o. p. oil meal, soybean oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Pennsy 16 Dairy Feed**

Wheat bran, cottonseed meal, cane molasses, corn gluten feed, dried brewers grains, o. p. oil meal, soybean oil meal, reground grain screenings from wheat, oat meal mill by-product (oat midds, oat hulls, oat shorts), 1% bone meal, 1% salt, 1% calcium carbonate.

**Eshelman Pennsy Laying Mash**

Corn meal, wheat middlings, meat scrap, wheat bran, ground oats, alfalfa meal, soybean oil meal, fish meal, corn gluten feed, 2% o. p. oil meal, 1% calcium carbonate,  $\frac{1}{2}$ % salt.

**Eshelman Red Rose All Mash Starter**

Corn meal, wheat bran, wheat middlings, pure oat meal, meat scrap, fish meal, alfalfa leaf meal, dried buttermilk, 2% o. p. oil meal, 2% calcium carbonate, 1¼% bone meal, ¼% salt, ¼% fortified cod liver oil.

**Eshelman Red Rose 24 Dairy Feed**

Cottonseed meal, wheat bran, corn gluten feed, cane molasses, corn gluten meal, ground oats, dried brewers grains, corn distillers grains, corn meal, o. p. oil meal, soybean oil meal, 1% bonemeal, 1% calcium carbonate, 1% salt.

**Eshelman Red Rose Laying Mash**

Wheat middlings, corn meal, meat scrap, wheat bran, corn gluten feed, ground oats, o. p. oil meal, fish meal, hominy feed, 3% fine alfalfa meal, 3% dried buttermilk, 1% calcium carbonate, ½% salt.

**Farm Service Stores, Inc.****Big C Growing Mash**

Corn feed meal (or yellow hominy), wheat feed, ground oats, meat scraps, dried skim (or dried buttermilk), fish scraps, fine ground alfalfa, calcium carbonate, ½% salt, cod liver oil.

**Big C Mash**

Corn feed meal (or yellow hominy), heavy mixed feed, gluten feed, old process oil meal, 45% meat scraps, fine ground alfalfa, ground oats, bone meal, calcium carbonate, ½% salt.

**Big C Special Dairy Feed**

Cottonseed meal, old process oil meal, hominy or corn meal, corn gluten feed, wheat bran, wheat midds, ground oats, 1% salt, 1% steamed bone meal, calcium carbonate.

**Diamond A Dairy Feed**

Corn feed meal (or yellow hominy), old process oil meal, corn gluten feed, wheat bran, dried brewers grains, corn gluten meal, cottonseed meal, stock feed, 1% salt, 1% calcium carbonate.

**Diamond C Dairy Feed**

Wheat bran, wheat midds, corn meal (or yellow hominy), cottonseed meal, old process oil meal, beet pulp, gluten feed, gluten meal, salt.

**Narragansett Indian Egg Mash**

Dried skim, or dried buttermilk, meat scraps, wheat midds, yellow corn meal, or yellow hominy, wheat bran, corn gluten feed, ground oats, hulled barley, ground oat blowings, old process oil meal, ground alfalfa meal, fish meal, ground calcite, salt.

**Narragansett Indian Growing Mash**

Dried skim, or dried buttermilk, 45% meat scraps, fish meal, wheat midds, second clear flour, corn feed meal or hominy, wheat bran, corn gluten feed, ground oats, ground barley, hulled barley, old process oil meal, alfalfa meal, salt, bone meal, calcite flour, fine charcoal.

**New England Dairy Ration**

Diamond gluten meal, Buffalo gluten feed, wheat bran, yellow corn meal or yellow hominy, old process oil meal, cottonseed meal, Sugared Vim Feed, ground limestone, salt.

**Quality Chick Starter**

Wheat bran, wheat midds, corn meal (or yellow hominy), feeding oatmeal, bone and meat meal, fish meal, dried skim or dried buttermilk, alfalfa meal, old process oil meal, calcium carbonate, with or without cod liver oil.

**Quality 26% Dairy Feed**

Wheat midds, red dog, corn feed meal (or yellow hominy), ground oats, soybean meal, brewers grains, C & O feed, wheat bran, gluten feed, cottonseed meal, old process oil meal, cane molasses, calcium carbonate 1%, bone meal 1%, salt 1%.

**Vigor 16% Dairy Feed**

Corn feed meal, soy bean meal, brewers grains, C & O feed, wheat bran, gluten feed, cottonseed meal, old process oil meal, oat feed, cane molasses, calcium carbonate 1%, bone meal 1%, salt 1%, wheat midds, red dog.

**Flory Milling Co., Inc.****Flory's Dairy Feed**

Cottonseed meal, o. p. oil meal, coconut oil meal, soybean meal, corn gluten feed, corn gluten meal, dried malt grains, alfalfa meal, standard wheat bran, standard wheat middlings, molasses, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), buckwheat middlings.

**Flory's Egg Mash**

Ground oat groats, dried skim milk, milk sugar feed or dried whey (feeding), wheat flour middlings, yellow corn meal, corn gluten meal, wheat bran, dried tomato pulp, ground barley, beef scrap, fish meal, crab meal, alfalfa leaf meal, o. p. oil meal, coconut oil meal, buckwheat middlings, soybean meal, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Record Dairy Feed**

O. p. oil meal, cottonseed meal, soybean meal, corn gluten feed, buckwheat middlings, standard wheat middlings, standard wheat bran, dried malt grains, ground oats, molasses, alfalfa meal, coconut oil meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).



## Fred A. Fountain

**Fountain's Buttermilk Growing Feed**

Dry buttermilk or dry skim milk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, table salt.

**Fountain's Buttermilk Laying Mash**

Dry buttermilk or dry skim milk, beef scrap, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, fish meal, table salt.

**Fountain's Buttermilk Starting Feed**

Dry buttermilk or dry skim milk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, calcium carbonate, table salt.

## Dean S. French

**Special Mash or Poultry Feed**

Wheat feed, corn meal, gluten feed, alfalfa meal, linseed meal, meat scraps, ground oats, ground bone, charcoal, dried milk, salt, cod liver oil.

## Paul Fuller &amp; Sons

**Fuller's Eggmaker Mash**

Dried skim milk, soy bean meal, alfalfa leaf meal, fine ground oats, feeding oat meal, red dog flour, meat scraps 45%, corn meal, standard wheat bran, gluten, calcium carbonate, salt, fish meal.

## J. B. Garland &amp; Son

**Garland's Economy 20% Dairy Ration**

Bran, middlings, meal, cottonseed meal, gluten feed, linseed meal, ground barley, dried brewers grains, soy bean meal, distillers grains, cocoanut oil meal, malt sprouts, bone meal, calcium carbonate, cane molasses and salt.

**Garland's Economy Egg Mash**

Wheat bran and middlings, corn meal, hominy, soy bean meal, gluten meal, feeding oatmeal, dried milk, beef scraps, ground alfalfa, cod liver oil, calcium carbonate, bone meal and salt.

**Garland's Fancy Chick Mash**

Wheat bran and middlings, oat meal, corn meal, alfalfa leaf meal, meat scraps, bone meal, fish meal, dried milk, soy bean meal, calcium carbonate, salt and cod liver oil. (With or without cane molasses.)

**Garland's Laying Mash**

Wheat bran and middlings, corn meal, gluten meal, oat meal, alfalfa, soy bean meal, meat scraps, fish meal, dried milk, calcium carbonate, salt, bone meal. (With or without cod liver oil.) (With or without cane molasses.)

**Garland's 24% Ration**

Wheat bran and middlings, corn meal, hominy, gluten feed, linseed meal, cottonseed meal, soy bean meal, cocoanut oil meal, ground oats, brewers grains, distillers grains, bone meal, calcium carbonate, salt and cane molasses.

**Royal Worcester Complete Ration**

Gluten feed, linseed, ground oats, wheat bran, middlings, corn meal, cottonseed meal, soy bean meal, beet pulp, salt, calcium carbonate, bone meal and cane molasses.

## General Mills, Inc.

**Eventually Gold Medal Chick Ration**

Wheat bran, wheat standard middlings, yellow corn meal, ground oat groats, alfalfa meal, meat and bone scraps, dried skim milk, dried buttermilk, ground limestone  $2\frac{1}{4}\%$ , salt  $\frac{1}{2}\%$ , cod liver oil extract.

**Eventually Gold Medal Dairy Ration**

Wheat bran, wheat standard middlings, ground oats, yellow corn meal, corn gluten feed, cottonseed meal, linseed oil meal, ground limestone  $2\frac{3}{4}\%$ , salt  $\frac{3}{4}\%$ .

**Eventually Gold Medal Egg Mash for Breeding and Laying with Dried Buttermilk**

Wheat bran, wheat standard middlings, yellow corn meal, ground oats, alfalfa meal, meat and bone scraps, dried skim milk, dried buttermilk, ground limestone 3%, salt 1%, cod liver oil extract.

## W. K. Gilmore &amp; Sons, Inc.

**Conference Mash with Cod Liver Oil**

Yellow corn meal, standard wheat bran, wheat flour middlings, pure ground oats, meat scraps 50%, pure fish meal 55%, alfalfa leaf meal, milk, calcite flour, cod liver oil, dicalcium phosphate, salt.

**Neponset Poultry Mash**

Wheat bran, wheat middlings, corn meal, ground oats, alfalfa, beef scraps, fish scraps, linseed oil meal, corn gluten feed, ground rolled oats, calcite flour, dried skim milk, fine salt.

## Goode Grain Co.

**Complete All Mash Starting and Broiler Feed, U. S. D. A. Formula**

Corn meal, middlings, bran, meat scraps, fish meal, milk dried, alfalfa leaf meal, ground oyster shells or calcium carbonate, salt, 1% cod liver oil.

## D. H. Grandin Milling Co.

**Grandin's Baby Chick Starter with Buttermilk— Cod Liver Oil**

Dried buttermilk, fine ground hulled oats, ground wheat, corn meal, hominy feed, wheat middlings, alfalfa leaf meal, calcium carbonate, bone meal, one half of one per cent salt, and cod liver oil.

**Grandin's 24% Balanced Dairy Ration**

Distillers dried grains, cottonseed meal, cocoanut oil meal, linseed oil meal, corn gluten feed, wheat bran, wheat middlings, hominy feed, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Complete Starting Ration with Buttermilk — Cod Liver Oil**

Dried buttermilk, cod liver oil, ground meat and bone, fish meal, wheat bran, wheat middlings alfalfa leaf meal, hominy feed, ground yellow corn, pulverized oats, ground wheat, ground hulled oats, ground barley, calcium carbonate and salt.

**Grandin's Sweetened 24% Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 20% Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 16% Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground barley, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Complete Laying Ration**

Dried buttermilk, concentrated cod liver oil, ground meat and bone, fish meal, corn gluten meal, alfalfa meal, ground yellow corn, hominy feed, ground wheat, pulverized barley, pulverized oats, wheat bran, wheat middlings, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Growing Mash with Buttermilk**

Ground meat and bone, dried buttermilk, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, alfalfa meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Growing Mash with Buttermilk — Cod Liver Oil**

Ground meat and bone, dried buttermilk, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, alfalfa meal, bone meal, calcium carbonate, salt and cod liver oil. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Laying Mash with Buttermilk**

Ground fish, ground meat and bone, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, powdered buttermilk, alfalfa meal, calcium carbonate and a small percentage of salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Laying Mash with Buttermilk — Cod Liver Oil**

Ground fish, ground meat and bone, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, powdered buttermilk, alfalfa meal, calcium carbonate, a small percentage of salt and cod liver oil. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Milk Maker**

Linseed oil meal, cottonseed meal, cocoanut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, beet pulp, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's 12 Twin Six 12 Dairy Feed**

Linseed oil meal, cottonseed meal, cocoanut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, alfalfa meal, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**M-S (Money-Saver) 20% Sweet Dairy Feed**

Cottonseed meal, linseed oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground grain screenings, oat meal mill by-products (oat middlings, oat hulls, oat shorts), cane molasses, steamed bone meal, calcium carbonate and salt.

## Hales &amp; Hunter Co.

**Red Comb Egg Mash with Dried Buttermilk**

Whole ground corn, feeding oat meal, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean meal, pulverized oats, fish meal, cod liver oil, sardine oil, dried buttermilk and not over 5% minerals (calcium carbonate, sodium chloride, steamed bone meal, granulated charcoal, iron sulphate, sulphur.)

## D. Harbeck

**Welcome Dairy Feed**

Bran, beet pulp, cottonseed meal, corn gluten meal, ground oats, hominy or corn feed meal, oil meal, middlings, steamed bone meal 1%, salt 1%.

## D. B. Hodgkins' Sons

**Hodgkins' Dairy Ration**

Wheat bran, hominy, ground oats, corn gluten feed, corn meal, cottonseed meal, soy bean meal, linseed meal, brewers grains, molasses, calcium carbonate and salt.

**Hodgkins' Poultry Mash**

Ground corn, oats, middlings and bran (with screenings not to exceed mill run), corn gluten feed, linseed meal, ground meat scraps, calcium carbonate, dried skim milk, dairy salt, fish meal, dried buttermilk, alfalfa leaf meal and charcoal, also with cod liver oil.

## Horvitz Grain Co.

**Make-M-Lay Laying Mash**

Wheat bran, corn meal, gluten feed and gluten meal, ground oats, ground barley, red dog, wheat middlings, linseed meal, meat scraps, calcium carbonate, charcoal.

**Wantmore 24% Dairy Ration Sweetened**

Bran, middlings, cottonseed meal, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten, ground barley, corn meal, cane molasses, soy bean meal, high grade edible bone meal, calcium carbonate, salt.

**Wantmore Dairy Ration**

Hominy feed or corn meal, wheat bran, ground oats, gluten feed and gluten meal, linseed meal, cottonseed meal, wheat middlings, calcium carbonate, salt.

**Wantmore Dairy with Beet Pulp**

Hominy feed or corn meal, wheat bran, gluten feed and gluten meal, linseed meal, cottonseed meal, wheat middlings, salt, beet pulp, calcium carbonate.

**Wantmore 20% Dairy Ration Sweetened**

Bran, middlings, cottonseed meal, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten, ground barley, corn meal, cane molasses, soy bean meal, high grade edible bone meal, calcium carbonate, salt.

## Jaquith &amp; Co.

**Jaquith & Co. Dairy Ration**

Wheat bran and middlings, c. s. meal, oil meal, soya bean meal, salt, gluten feed, alfalfa, ground oats, corn, dried grains, molasses.

**Jaquith & Co. Growing Mash**

Ground corn, wheat and oats, soy bean meal, meat and bone meal, salt, buttermilk, alfalfa, Nopco XX cod liver oil, oil meal, shell meal.

**Jaquith & Co. Laying Mash**

Ground corn, wheat and oats, gluten feed, oil meal, meat scraps, buttermilk, soy bean meal, alfalfa meal, salt, Nopco XX cod liver oil, shell meal.

## Jersee Co.

**Just Right 20 Dairy Ration**

Old process linseed oil meal, choice cottonseed meal, choice yellow hominy, corn gluten feed, pure wheat bran, Diamond gluten meal, pure ground oats, 1% calcium phosphate, 1% salt.

**Just Right Egg Mash**

Standard middlings, standard bran, corn meal, corn gluten feed, fine ground oats, meat scraps, fish meal, charcoal, calcium carbonate (limestone), alfalfa meal, powdered whole and skim milk, St. John's bread (locust bean meal), starch, milk sugar, wheat red dog, oxide iron, di-calcium phosphate, anise, dried blood, iodized salt, yeast, cod liver oil.

**Just Right Growing Mash**

Standard middlings, feeding oat meal, corn meal, alfalfa meal, meat scraps, fish meal, bone meal, charcoal, calcium carbonate (limestone), powdered whole and skim milk, St. John's bread, starch, milk sugar, wheat red dog, oxide iron, di-calcium phosphate, anise, dried blood, iodized salt, yeast, cod liver oil.

## Larowe Milling Co.

**Larro — The Ready Ration for Dairy Cows**

Yellow corn meal, cottonseed meal, standard wheat middlings, o. p. linseed oil meal, corn gluten feed, dried beet pulp, wheat bran,  $\frac{3}{4}$ % salt.

**Larro Chick Starter**

Yellow corn meal, ground oat groats, wheat standard middlings, wheat bran, meat and bone scraps, dried buttermilk, dried skimmed milk, alfalfa meal,  $1\frac{3}{4}$ % limestone,  $\frac{1}{2}$ % salt, cod liver oil extract.

**Larro Egg Mash**

Wheat bran, wheat standard middlings, yellow corn meal, meat and bone scraps, ground barley, soybean oil meal, ground oats, alfalfa meal, dried skimmed milk, dried buttermilk,  $2\frac{1}{2}$ % limestone,  $\frac{1}{2}$ % salt, cod liver oil extract.

**Larro Growing Mash**

Yellow corn meal, wheat standard middlings, wheat bran, meat and bone scraps, alfalfa meal, ground oats, dried buttermilk, dried skimmed milk, soybean oil meal, 2 % limestone,  $\frac{1}{2}$  % salt, cod liver oil extract.

**Mansfield Milling Co.****"Mansfield" Chick-Growing Feed**

Wheat bran, red dog flour, corn meal, oat meal, fish scraps, meat scraps, dried milk and charcoal.

**"Mansfield" Cow-Ration**

Wheat bran, corn meal, ground oats, ground barley, cottonseed meal, linseed meal, gluten feed, gluten meal and salt.

**"Mansfield" Dry-Poultry Mash**

Wheat bran, wheat middlings, red dog flour, corn meal, gluten feed, dried milk and meat scraps.

**Maritime Milling Co., Inc.****Sweetened B B Bull Brand "24" Dairy Ration**

Dried brewers grains, o. p. linseed oil meal, cotton seed meal, corn gluten feed, soya bean oil meal, hominy feed, corn meal, wheat bran, wheat middlings, molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**B B Bull Brand Growing Mash Vitamized with Cod Liver Oil, Milk Sugar Feed, Dried Buttermilk**

Cod liver oil, milk sugar feed, dried buttermilk, alfalfa leaf meal, wheat bran, wheat middlings, ground wheat, corn meal, pulverized oats, ground oat meal, soya bean oil meal, meat meal, fish meal, steamed bone meal, calcium carbonate and salt.

**B B Hi-Test Dairy Feed 20% Pro. Sweetened**

Dried brewers grains, o. p. linseed oil meal, cotton seed meal, corn gluten feed, soya bean oil meal, hominy feed, ground oats, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, oat hulls, oat shorts, oat midds, molasses, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

**B B Marmico 16% Protein Dairy Feed with Molasses**

Dried brewers grains, soya bean oil meal, cotton seed meal, corn gluten feed, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, oat hulls, oat shorts, oat midds, molasses, steamed bone meal, calcium carbonate and salt.

**B B Red-E-Mixt Egg Mash with Dried Buttermilk**

Dried buttermilk, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, fish meal, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain mill run of ground screenings.)

**B B Red-E-Mixt Egg Mash Vitamized with Cod Liver Oil and Dried Buttermilk**

Cod liver oil, dried buttermilk, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, fish meal, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain mill run of ground screenings.)

**Sweetened Dollar \$ Maker 24% Pro. Dairy Feed**

Dried brewers grains, soya bean oil meal, corn gluten feed, o. p. linseed oil meal, cotton seed meal, corn meal, hominy feed, wheat bran, ground oats, molasses, calcium carbonate, salt and steamed bone meal. (Wheat bran may contain ground screenings not exceeding mill run.)

**Sweetened Dollar \$ Maker 20% Pro. Dairy Feed**

Dried brewers grains, soya bean oil meal, corn gluten feed, o. p. linseed oil meal, cotton seed meal, corn meal, hominy feed, wheat bran, ground oats, molasses, calcium carbonate, salt and steamed bone meal. (Wheat bran may contain ground screenings not exceeding mill run.)

**Dollar \$ Maker Egg Mash**

Dried buttermilk, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Dollar \$ Maker Egg Mash Vitamized with Cod Liver Oil and Dried Buttermilk**

Cod liver oil, dried buttermilk, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Dollar \$ Maker Growing Mash Vitamized with Cod Liver Oil and Dried Buttermilk**

Cod liver oil, dried buttermilk, wheat bran, wheat middlings, soya bean oil meal, corn meal, pulverized barley, pulverized oats, meat meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Matheson Vail Co.****Mavco Laying Mash**

Coarse corn meal, wheat bran, wheat middlings, ground oats, meat scraps 50 %, fish meal 50 %, dried skim milk, salt, alfalfa leaf meal, ground oyster shells, cod liver oil.

**Mavco Starting and Growing Mash**

Coarse corn meal, wheat bran, wheat middlings, ground oats, meat scraps 50 %, dried skim milk, fish meal 50 %, alfalfa leaf meal, calcium carbonate, salt, cod liver oil.

## Geo. Q. Moon &amp; Co., Inc.

**Moon's Baby Chick Starter Mash**

Roller corn meal, wheat middlings, Moon's white wheat middlings, fine ground alfalfa meal, meat scrap, bone meal, dried buttermilk, calcium carbonate, calcium phosphate, cod liver oil,  $\frac{1}{2}$  of 1% salt, wheat bran, dried skim milk.

**Moon's 24% Dairy Ration**

Corn distillers grain, o. p. oil meal, corn gluten meal, cottonseed meal, corn gluten feed, wheat middlings and wheat bran (with ground screenings not to exceed mill run), dried brewers grains, calcium carbonate,  $\frac{3}{4}$  of 1% salt, corn meal, soy bean meal, molasses.

**Moon's 20% Dairy Feed with Molasses**

O. p. oil meal, corn gluten meal, cottonseed meal, wheat bran and wheat middlings (with ground screenings not to exceed mill run), dried brewers grains, cleaned, ground and bolted wheat screenings, ground and bolted clipped oat by-product, molasses, corn gluten feed, calcium carbonate,  $\frac{1}{2}$  of 1% salt, soy bean meal.

**Moon's Growing Mash**

Wheat bran, Moon's white wheat middlings, roller corn meal, fine ground alfalfa meal, meat scrap, bone meal, dried buttermilk, calcium carbonate, calcium phosphate, dried skim milk, cod liver oil.

**Moon's Laying Mash with Dried Buttermilk**

Wheat bran (with ground screenings not to exceed mill run), Moon's pure white wheat middlings, roller process corn meal, ground oats, fine ground pea green alfalfa meal, beef scrap, dried buttermilk, ground barley, ground buckwheat, calcium carbonate, calcium phosphate, corn gluten meal.

**Open Formula Dairy Ration**

Standard wheat bran, choice yellow hominy, pure ground oats (No. 2 38# clipped-unsl.), corn gluten feed, choice cottonseed meal, soy bean meal, o. p. linseed oil meal — pure, corn dist. dried grains, molasses, dicalcium phosphate, salt.

**Special A Dairy 20% Ration**

Corn gluten feed, cottonseed meal, oil meal, wheat bran, hominy, dried brewers grains, ground barley, calcium carbonate, calcium phosphate,  $\frac{1}{2}$  of 1% salt, soy bean meal.

**Moon's Special A Laying Mash with Dried Buttermilk**

Meat scrap, alfalfa meal, standard wheat middlings (with ground screenings not to exceed mill run), corn meal, ground barley, ground oats, ground buckwheat, calcium carbonate, calcium phosphate,  $\frac{1}{2}$  of 1% salt, dried buttermilk, corn gluten meal.

**Moon's X Dairy Ration**

Corn gluten feed, corn gluten meal, soy bean meal, cottonseed meal, wheat middlings, oil meal, molasses, cleaned, ground and bolted wheat screenings, ground and bolted clipped oat by-product, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

## Ogden Grain Co.

**Good Value Laying Mash**

Pulverized 36/38 No. 2 oats, meat scraps, fish meal, alfalfa leaf meal, No. 2 yellow corn meal, standard wheat bran, wheat flour middlings, dried skim milk, calcium carbonate, salt, cod liver oil.

**Good Value 24% Thrift Dairy Ration**

Soyabean oil meal, old process linseed oil meal, gluten meal, corn meal, low fiber ground oats, cotton seed meal, standard wheat bran, standard wheat middlings, ground wheat screenings, molasses, calcium carbonate and salt.

**Good Value 20% Thrift Dairy Ration**

Soyabean oil meal, old process linseed oil meal, gluten meal, corn meal, low fiber ground oats, cotton seed meal, standard wheat bran, standard wheat middlings, ground wheat screenings, molasses, calcium carbonate and salt.

**Good Value Thrift Laying Mash**

Pulverized 38/40 No. 2 oats, meat scraps, dried skim milk, No. 2 yellow corn meal, gluten meal, standard wheat bran, standard wheat middlings, fish meal, calcium carbonate, salt, cod liver oil.

**Good Value Thrift Starting and Growing Mash**

Corn meal, standard wheat bran, pulverized oats, flour middlings, dried skim milk, alfalfa meal, fish meal, meat scraps, calcium carbonate, salt, cod liver oil.

## Park &amp; Pollard Co.

**All-In-One Laying Mash**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, Iodol fish meal, meat and bone meal, linseed oil meal, soya bean meal, wheat bran, wheat middlings, ground: yellow corn, oats, wheat, barley, calcium carbonate and salt.

**Bet-R-Milk 20% Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, malt sprouts, wheat bran, wheat middlings, hominy feed, Iodol fish meal, molasses, calcium carbonate, salt, corn distillers grains.

**Lay or Bust Dry-Mash**

Dried buttermilk, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soya bean meal, wheat bran and wheat middlings, calcium carbonate, salt, ground corn, wheat, oats, barley, kafir corn, buckwheat.



**Lay or Bust Dry-Mash with Cod Liver Oil**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soya bean meal, wheat bran and wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley, kaffir corn, buckwheat.

**Manamar Complete Ration**

Kelp, Pacific Coast fish meal and marine sea shells, meat scrap, pure wheat bran; wheat middlings, alfalfa meal, ground yellow corn, ground oats, vitamin tested cod liver oil.

**Manamar 24% Dairy Ration**

Kelp, Pacific Coast fish meal and marine sea shells, corn gluten feed, linseed oil meal, cottonseed meal, distillers dried grains, wheat bran, brewers dried grains, malt sprouts, corn gluten meal, copra oil meal, corn meal, molasses, calcium carbonate and salt.

**Manamar Lay or Bust Mash**

Kelp, Pacific Coast fish meal and marine sea shells, dried buttermilk, meat scrap, alfalfa meal, pure wheat bran, wheat middlings, ground yellow corn, ground oats, vitamin tested cod liver oil.

**Milk-Maid 24% Sweetened Dairy Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, distillers dried grains, wheat bran, brewers dried grains, malt sprouts, corn gluten meal, copra oil meal, corn meal, Iodol fish meal, molasses, calcium carbonate, and salt.

**Park & Pollard Growing Feed**

Dried buttermilk, alfalfa leaf meal, Iodol fish meal, linseed oil meal, meat and bone meal, wheat bran and wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley.

**Park & Pollard Growing Feed with Cod Liver Oil**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, linseed oil meal, Iodol fish meal, meat and bone meal, wheat bran and wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley.

**Top Notch 16% Ration**

Corn distillers grains, ground barley, linseed oil meal, cottonseed meal, malt sprouts, fine ground grain screenings, molasses, calcium carbonate and salt.

**Yankee Dairy Ration**

Corn gluten feed, cottonseed meal, wheat bran, wheat middlings, corn gluten meal, linseed oil meal, ground oats, corn meal, brewers grains, molasses, calcium carbonate and salt.

**George H. Parker Grain Co.****Parker's Egg Mash**

Yellow corn meal, wheat bran, wheat midds, ground oats, feeding oat meal, dried skimmed milk, meat scraps, fish meal, alfalfa leaf meal, edible bone meal, calcium carbonate, charcoal, vitamin tested cod liver oil and salt.

**Parker's Special Dairy Ration**

Wheat bran, yellow corn meal, hominy, old process linseed meal, oat feed, corn gluten feed, cottonseed meal, molasses, calcium carbonate, steamed bone meal and salt.

**W. N. Potter Grain Stores, Inc.****Potter's Sweetened Dairy Ration**

Gluten feed, hominy, linseed oilmeal, ground oats, wheat bran, std. wheat middlings, cotton seed meal, corn distillers grains, molasses, calcium carbonate, bone meal and salt.

**H. C. Puffer Co.****Egg-Em-On Growing Feed**

Corn feed meal, corn gluten feed, ground barley, ground oats, wheat bran, wheat middlings, meat scraps, dried milk, alfalfa meal.

**Egg-Em-On Laying Mash**

Dried milk, dried fish, meat scraps, wheat bran and wheat middlings (not exceeding mill run of screenings), corn feed meal, corn gluten feed, ground oats, linseed meal, alfalfa meal, small percentage salt and calcium carbonate.

**Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, corn gluten meal, ground oats, corn feed meal, wheat bran and wheat middlings (not exceeding mill run of screenings), small percentage salt and calcium carbonate.

**Sweetened Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, corn gluten meal, corn feed meal, wheat bran and wheat middlings (not exceeding mill run of screenings), oat feed, molasses, small percentage salt and calcium carbonate.

**Quaker Oats Co.****Quaker 24% Protein Dairy Ration**

Hominy feed, yellow hominy feed, cottonseed meal, corn gluten feed, linseed meal, wheat bran, wheat middlings, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% ground limestone, molasses.

**Quaker 20% Protein Dairy Ration**

Hominy feed, yellow hominy feed, barley meal, cottonseed meal, corn gluten feed, linseed meal, wheat bran, wheat middlings, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% ground limestone, molasses.

**Quaker 16% Protein Dairy Ration**

Hominy feed, yellow hominy feed, cottonseed meal, linseed meal, gluten feed, wheat bran, wheat middlings, ground grain screenings from wheat, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% ground limestone, molasses.

**Quaker Ful-O-Pep Chick Starter**

Oatmeal, yellow hominy feed, wheat bran, wheat middlings, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Quaker Ful-O-Pep Egg Mash**

Oatmeal, hominy feed, yellow hominy feed, wheat bran, wheat middlings, barley meal, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Quaker Ful-O-Pep Growing Mash**

Oatmeal, yellow hominy feed, wheat bran, wheat middlings, barley meal, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Ralston Purina Co.****Purina Blue Checker Cow Chow (20%)**

Dried beet pulp, linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, wheat middlings, (standard) wheat bran, corn meal, alfalfa meal, molasses, 1% iodized salt.

**Purina Breeder Egg Chowder**

Dried buttermilk, cod liver oil, sardine oil, alfalfa meal, meat scrap, soy bean oil meal, linseed meal, corn germ meal, wheat middlings, wheat bran, corn meal, 1% iodized salt, 3% calcium carbonate (limestone).

**Purina Bulky Cow Chow**

Linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, wheat middlings, (standard) wheat bran, corn meal, alfalfa meal, dried beet pulp, molasses, 1% iodized salt.

**Purina Chick Startena (Complete — All Mash)**

Dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, alfalfa leaf meal, wheat germ, linseed meal, corn germ meal, oat middlings, corn meal, wheat bran, grey wheat middlings,  $1\frac{1}{2}\%$  calcium carbonate (limestone),  $\frac{1}{2}\%$  iodized salt.

**Purina Chicken Fatena**

Ground oats, ground corn, corn germ meal, wheat flour (second clear), grey wheat middlings, ground barley, linseed meal, rolled oats,  $\frac{1}{2}\%$  iodized salt,  $1\frac{1}{2}\%$  calcium carbonate (limestone).

**Purina Egg Chowder**

Meat scrap, soy bean oil meal, linseed meal, alfalfa meal, corn germ meal, wheat middlings, wheat bran, corn meal, 1% iodized salt, 3% calcium carbonate (limestone).

**Purina Turkey Growing and Fattening Chow**

Meat scrap, soy bean oil meal, alfalfa meal, corn meal, wheat middlings, wheat bran, molasses,  $\frac{1}{2}\%$  iodized salt.

**Ryther & Warren****Blue Tag Dairy Ration**

41% cottonseed meal, old process linseed oil meal, corn gluten feed, white hominy, standard bran, standard middlings, ground oats, dried beet pulp, calcium carbonate 1 per cent and salt  $\frac{1}{2}$  of 1 per cent.

**Minot Chick Mash, Starting and Growing Feed**

Yellow corn meal, wheat bran, flour middlings, ground oat meal, meat scraps, 50% pro., fish meal 55% pro., alfalfa leaf meal, shell meal, dried milk, salt, Nopco XX cod liver oil.

**Minot Milk Egg Mash**

Yellow corn meal, wheat bran, flour middlings, ground 40-lb. oats, meat scraps 50% pro., fish meal 55% pro., alfalfa leaf meal, shell meal, dried milk, salt, Nopco XX cod liver oil.

**Minot Poultry Mash (Plain)**

Wheat bran, wheat middlings, red dog middlings, corn meal, gluten feed, alfalfa meal, ground oats, meat scraps, fish meal and  $\frac{1}{2}$  of 1 per cent of salt.

**St. Albans Grain Co.****Utility Dairy Ration**

Old process linseed meal, soybean oil meal, corn gluten feed, cottonseed meal, corn meal, ground oats, ground barley, brewers' dried grains, oat meal mill by-products (oat middlings, oat shorts, oat hulls), wheat bran, wheat middlings, calcium carbonate, pure cane molasses and dairy salt.

**Wirthmore 25 Balanced Ration**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, brewers' dried grains, pure ground oats, cottonseed meal, corn gluten feed, yellow corn meal, wheat middlings, wheat bran, edible bone meal and dairy salt.

**Wirthmore Breeder Mash**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, corn germ meal, alfalfa leaf meal, linseed oil meal, soybean oil meal, corn gluten meal, wheat bran, wheat middlings, pulverized oats and barley, calcium carbonate and salt.

**Wirthmore Complete Chick and Broiler Ration**

Fortified cod liver oil, yellow corn meal, wheat bran, wheat middlings, ground oat groats, meat scraps, fish meal, alfalfa leaf meal, old process linseed oil meal, soybean oil meal, dried skim milk, dried whey (milk sugar feed), calcium carbonate, salt and cod liver meal.

**Wirthmore Complete Laying Ration**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, whole oat groats, ground yellow corn, ground oats, alfalfa leaf meal, ground wheat, wheat bran, wheat middlings, calcium carbonate and salt.

**Wirthmore 20 Dairy Feed**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, pure ground oats, wheat middlings, wheat bran, edible bone meal and dairy salt.

**Wirthmore Growing Mash**

Dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, alfalfa leaf meal, old process linseed meal, soybean oil meal, ground wheat, oats, barley, wheat bran, wheat middlings, wheat red dog, calcium carbonate and salt.

**Wirthmore Laying Mash**

Dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, alfalfa leaf meal, linseed meal, soybean oil meal, corn gluten feed, wheat bran, wheat middlings, ground oats, barley, buckwheat, calcium carbonate and salt.

**Wirthmore Turkey Fattening Ration**

Dried skim milk, dried whey (milk sugar feed), meat scraps, alfalfa meal, yellow corn meal, fine ground oats, wheat bran, wheat middlings, wheat flour middlings, salt, ground barley.

Squier & Co.

**Squier's Buttermilk Egg Mash**

Dried buttermilk, meat scrap, fish meal, bone meal, corn gluten feed, alfalfa meal, wheat bran, wheat middlings, corn meal, ground oats, soybean oil meal, calcium phosphate and salt.

D. A. Stickell & Sons, Inc.

**Dairy Queen Sweet 20% Milk Maker**

Linseed meal, cottonseed meal, corn gluten feed, soybean oil meal, coconut oil meal, wheat bran, wheat middlings, beet pulp, molasses, corn meal, bone meal, 1% calcium carbonate, 1% salt.

C. H. Symmes

**The Ideal Dairy Ration**

Wheat middlings, wheat bran, brewers grains, cottonseed meal, linseed meal, gluten meal, gluten feed, corn meal or hominy, salt, molasses, bone meal, calcium carbonate, ground barley.

Syracuse Milling Co.

**Syracuse Dairy Feed**

Corn meal, ground oats, wheat bran and wheat middlings with mill run screenings, toasted wheat feed (wheat and wheat bran processed), corn gluten feed, linseed meal, cottonseed meal, soy bean oil meal, distillers' dried grains, brewers' dried grains, calcium carbonate and salt.

Tioga-Empire Feed Mills, Inc.

**E-Gee Dairy Feed**

Wheat bran, cottonseed meal, corn gluten feed, hominy feed, wheat middlings, cane molasses, salt, phosphate of lime, charcoal, iodine, brewers dried grains, corn distillers grains, coconut oil meal. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**Or-Co Feed**

Cottonseed meal, ground grain screenings, salvaged mixed feeds, corn gluten feed, cane molasses, salt, malt sprouts.

**Red Brand Tioga Dairy Feed**

Coconut oil meal, wheat bran, cottonseed meal, corn gluten feed, wheat middlings, peanut oil meal, cane molasses, iodine, salt, phosphate of lime, charcoal, soybean oil meal, brewers dried grains, corn distillers grains. (Wheat bran and wheat midds may contain ground screenings not exceeding mill run.)

**Special Open Formula Dairy Ration 24%**

Wheat bran (may contain mill run screenings), yellow hominy, pure ground oats, old process linseed oil meal, corn gluten feed, corn distillers dried grains, cottonseed meal, molasses, soybean oil meal, dicalcium phosphate, salt.

**Special Open Formula Dairy Ration 20%**

Wheat bran (may contain mill run screenings), yellow hominy, pure ground oats, corn gluten feed, cottonseed meal, soy bean oil meal, old process linseed oil meal, corn distillers dried grains, molasses, dicalcium phosphate, salt.



## United Cooperative Farmers, Inc.

**United Farmers Milk Egg Mash**

No. 2 yellow corn meal — attrition, standard wheat bran, wheat flour middlings, pure gr. oats (No. 2 — 38 lb. clpd-unsul.), meat scraps 50 %, pure fish meal 55 %, alfalfa leaf meal, pure dried buttermilk, steamed bone meal, salt.

**United Farmers Milkmaker**

Choice yellow hominy, pure gr. oats (No. 2 — 38 lb. clpd-unsul.), standard wheat bran, choice cottonseed meal, old pro. linseed oil meal, corn gluten feed, soy bean oil meal, molasses, corn dist. dried grains, steamed bone meal, calcium carbonate, salt.

**United Farmers Milk Pep**

Choice cottonseed meal, old pro. linseed meal, choice yellow hominy, corn gluten feed, pure gr. oats (No. 2 — 38 lb. clpd-unsul.), soy bean oil meal, standard wheat bran, corn dist. dried grains, molasses, steamed bone meal, calcium carbonate, salt.

## C. P. Washburn Co.

**"Made Right" Balanced Ration**

Cottonseed meal, linseed oil meal, corn gluten, wheat bran, corn meal, oat feed, beet pulp, charcoal, calcium carbonate, salt, bone meal, ground oats, soya bean meal, brewers grains.

**"Made Right" Dry Mash**

Corn meal, wheat bran, wheat middlings, red dog, 2nd clear flour, gr. oatmeal, linseed oil meal, gluten feed, soya bean meal, ground wheat, meat scraps, fish meal, dried skim milk, alfalfa leaf meal, molasses, charcoal, calcium carbonate, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

**"Made Right" Starting and Growing Feed**

Corn meal, wheat bran, wheat middlings, oat meal, gluten meal, red dog, 2nd clear flour, meat scraps, gr. wheat, soya bean meal, fish meal, dried skim milk, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

**"Made Right" Sweet Dairy Feed**

Corn meal, wheat meal, ground oats, cottonseed meal, linseed oil meal, wheat bran, soya bean meal, gluten, molasses, bone meal, calcium carbonate, salt, brewers grain.

## H. K. Webster Co.

**Blue Seal Breeders' Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground heavy oats, ground rolled oats, ground barley, corn gluten meal, 50 % meat scraps, dried skim milk, 55 % codfish meal, alfalfa leaf meal, salt, calcium carbonate, cod liver oil.

**Blue Seal Chick Starter**

No. 2 yellow corn meal, ground fancy wheat, fine ground heavy oats, ground barley, corn gluten meal, pure wheat bran, wheat flour middlings, high grade meat scraps, dried skim milk, 55 % codfish meal, alfalfa leaf meal, calcium carbonate, salt, cod liver oil.

**Blue Seal "20" Dairy Ration**

Choice cottonseed meal, hominy feed, malt sprouts, gluten feed, wheat bran, ground oats, P. R. cane molasses, peanut skins, germs and meal, o. p. oil meal, white fish meal, salt.

**Blue Seal Growing Mash Fortified with Cod Liver Oil**

Dried skim milk, dried buttermilk, h. g. meat scraps, 55 % fish meal, alfalfa leaf meal, gluten meal, No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground oats, ground barley, calcium carbonate, salt, cod liver oil, P. R. cane molasses.

**Blue Seal Hom-Mix 24% Dairy Ration**

Choice cottonseed meal, gluten meal, malt sprouts, wheat bran, P. R. cane molasses, oat feed, o. p. oil meal, peanut skins, germs and meal, hominy feed, calcium carbonate, salt.

**Blue Seal Improved All-Mash Ration**

Coarse ground No. 2 yellow corn, ground fancy wheat, fine ground heavy oats, pure wheat bran, wheat flour middlings, h. g. meat scraps, dried skim milk, dried buttermilk, alfalfa leaf meal, P. R. cane molasses, calcium carbonate, salt, cod liver oil, codfish meal 55 %.

**Blue Seal Improved Balanced Ration**

Choice cottonseed meal, hominy feed, malt sprouts, wheat bran, gluten meal, ground oats, P. R. cane molasses, peanut skins, germs and meal, o. p. oil meal, corn distillers grains, white fish meal, salt.

**Blue Seal Laying Mash Fortified with Cod Liver Oil**

No. 2 yellow corn meal, pure wheat bran, fine ground heavy oats, h. g. meat scraps, corn gluten meal, wheat flour middlings, ground barley, ground fancy wheat, P. R. cane molasses, alfalfa leaf meal, dried skim milk, dried buttermilk, 55 % codfish meal, salt, calcium carbonate, cod liver oil.

**Blue Seal Milk Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, fine ground heavy oats, 50 % meat scraps, dried skim milk, 55 % fish meal, alfalfa leaf meal, salt, cod liver oil, cod liver meal blend.

**Blue Seal Special 20% Dairy Ration**

Choice cottonseed meal, gluten feed, malt sprouts, wheat bran, P. R. cane molasses, oat feed, o. p. oil meal, peanut skins, germs and meal, hominy feed, calcium carbonate, salt.

**Blue Seal Turkey Growing**

Dried skim milk, dried buttermilk, alfalfa leaf meal, h. g. meat scraps, 55 % fish meal, pure wheat bran, pure wheat middlings, No. 2 yellow corn meal, fine ground heavy oats, salt, dicalcium phosphate, calcium carbonate, cod liver oil.

West-Nesbitt, Inc.

**All Pure 20 % Milk Ration**

Choice cottonseed meal, corn distillers' dried grains, corn gluten meal, old process linseed oil meal, corn gluten feed, wheat bran, wheat middlings, hominy feed or corn meal, pure cane molasses, 1 % steamed bone meal, 1 % calcium carbonate,  $\frac{1}{2}$  of 1 % salt. Bran may contain screenings not to exceed mill run.

**Pure Feed Dairy Ration**

Corn gluten feed, corn distillers' dried grains, wheat middlings, wheat bran, beet pulp, hominy, or corn meal, choice cottonseed meal, old process linseed oil meal, 1 % steamed bone meal, 1 % calcium carbonate,  $\frac{1}{2}$  of 1 % salt. Bran may contain screenings not to exceed mill run.

**Pure Feed Egg Maker**

Dried skim milk, bone and meat meal, old process linseed oil meal, corn gluten feed, wheat middlings, wheat flour middlings, hominy or corn meal, steamed bone meal, 1 % calcium carbonate, 1 % salt.

**Pure Feed Egg Mash**

Corn meal, oat flour, wheat bran, wheat flour middlings, leaf alfalfa meal, dried skim milk, meat scraps, fish meal, steamed bone meal, 1 per cent calcium carbonate,  $\frac{3}{4}$  per cent salt, cod liver oil.

**Pure Feed Growing Mash**

Oat flour, corn meal, wheat red dog flour, standard wheat middlings, wheat bran, 50 % meat scraps, leaf alfalfa meal, dried skim milk, cod liver oil, steamed bone meal 1 % calcium carbonate,  $\frac{1}{2}$  of 1 % salt.

**Special 24 Per Cent Dairy Ration**

Choice 41 % cottonseed meal, corn gluten feed, corn gluten meal, corn meal, wheat bran dried brewers' grains, oatmeal mill by-product (oat middlings, oat shorts, oat hulls), pure cane molasses, 1 % steamed bone meal, 1 % calcium carbonate,  $\frac{1}{2}$  of 1 % salt. Bran may contain screenings not to exceed mill run.

**Special 20 Per Cent Dairy Ration**

Choice 41 % cottonseed meal, corn gluten feed, corn gluten meal, corn meal, wheat bran, oatmeal mill by-product (oat middlings, oat shorts, oat hulls), pure cane molasses, 1 % steamed bone meal, 1 % calcium carbonate,  $\frac{1}{2}$  of 1 % salt. Bran may contain screenings not to exceed mill run.

**Super Pure Sweetfeed Dairy Ration**

Corn gluten feed, corn distillers' dried grains, choice cottonseed meal, old process linseed oil meal, wheat bran, hominy or corn meal, pure cane molasses, 1 % steamed bone meal, 1 % calcium carbonate,  $\frac{1}{2}$  of 1 % salt. Bran may contain screenings not to exceed mill run.

Est. M. G. Williams

**Williams' Balanced Ration**

Corn meal or hominy, linseed oil meal, cottonseed meal, ground oats, gluten feed, dried brewers grains, wheat feed, calcium carbonate and 1 % salt.

**Williams' Laying Mash**

Corn meal, bran, middlings, ground oats, beef scraps, fish meal, leaf meal, dried skim milk, calcium carbonate, salt and cod liver oil.

Stanley Wood Grain Co.

**Bliss Dairy Ration**

Corn meal (or hominy), cottonseed meal, wheat bran, linseed meal, wheat middlings, gluten meal, gluten feed, table salt, edible bonemeal, calcium carbonate, (beet pulp).

**Preferred Laying Mash**

Pure dried skim milk, dried fish meal, alfalfa leaf meal, beef scraps, yellow corn meal, wheat bran, pulverized oats, wheat middlings, edible bonemeal, table salt, calcium carbonate.

**Preferred Starting and Growing Feed**

Pure dried skim milk, dried fish meal, yellow corn meal, wheat bran, wheat middlings, fine ground oatmeal, alfalfa leaf meal, beef scraps, edible bonemeal, table salt, calcium carbonate.

**Wood's Dairy Ration**

Wheat middlings, malt sprouts, linseed meal, corn meal (or hominy), wheat bran, cottonseed meal, gluten feed, ground oats, edible bonemeal, molasses, calcium carbonate, salt.

**Average Analyses and Retail Ton Prices of Unmixed By-Products**  
**(September 1, 1932, to April 1, 1933)**

FEEDSTUFFS.	Num- ber of Sam- ples.	Water (Per Cent.)	Pro- tein (Per Cent.)	Fat (Per Cent.)	Nitro- gen Free Ex- tract (Per Cent.)	Fiber (Per Cent.)	Ash (Per Cent.)	Price Per Ton.
Cottonseed Meal . . . . .	59	6.5	41.6	6.8	28.9	10.0	6.2	\$34 71
Linseed meal . . . . .	26	8.1	37.5	5.8	35.1	7.6	5.9	45 71
Gluten meal . . . . .	22	7.7	44.5	1.5	42.6	2.2	1.5	37 18
Gluten Feed . . . . .	47	8.9	27.3	2.5	48.5	6.9	5.9	31 74
Wheat Standard Middlings . .	28	8.9	18.9	5.7	54.4	7.5	4.6	28 73
Wheat Flour Middlings . . .	10	9.2	18.8	5.3	57.7	5.3	3.7	32 50
Red Dog Flour . . . . .	7	9.9	17.3	3.9	64.4	1.8	2.7	34 25
Wheat Mixed Feed . . . . .	62	8.6	17.4	4.7	56.7	7.6	5.0	31 80
Wheat Bran . . . . .	64	8.4	17.4	5.1	53.2	10.0	5.9	28 00
Rye Feed . . . . .	8	8.8	17.5	3.5	61.8	5.1	3.3	22 25
Corn Meal . . . . .	43	10.3	9.9	4.5	71.5	2.3	1.5	29 08
Ground Oats . . . . .	61	8.1	12.5	3.7	61.2	11.0	3.5	38 04
Hominy Feed . . . . .	43	8.2	11.2	7.2	66.2	4.7	2.5	29 62
Dried Beet Pulp . . . . .	9	8.0	8.9	0.5	59.3	20.3	3.0	29 63

# Directory of Manufacturers Who Registered Feeding Stuffs for Sale in Massachusetts in 1934.

- Albers Bros. Milling Co., Seattle, Wash.  
 E. T. Allen Co., P. O. Box 951, Atlanta, Ga.  
 Allied Mills, Inc., Chicago, Ill.  
 American Maize-Products Co., 100 East 42nd St., New York, N. Y.  
 A. P. Ames Co., Peabody, Mass.  
 Anchor Mills, Hagerstown, Md. (Registered by D. A. Stickell & Sons, Inc.)  
 Anheuser-Busch, Inc., St. Louis, Mo.  
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.  
 Archer-Daniels-Midland Co., Minneapolis, Minn.  
 Ashcraft-Wilkinson Co., Trust Co. of Georgia Bldg., Atlanta, Ga.  
 E. W. Bailey & Co., Montpelier, Vt.  
 Barber & Bennett, Inc., Albany, N. Y.  
 Beacon Milling Co., Inc., Cayuga, N. Y.  
 Berkshire Coal & Grain Co., Inc., North Adams, Mass.  
 Bisbee Linseed Co., Lincoln-Liberty Bldg., Philadelphia, Penn.  
 Black Rock Milling Corp., 356 Hertel Ave., Buffalo, N. Y. (Registered by Park & Pollard Co.)  
 Bolduc & Sons, 210 North Water St., New Bedford, Mass.  
 Borden Grain Co., 18 Dana St., Taunton, Mass.  
 Borden Sales Co., Inc., 350 Madison Ave., New York, N. Y.  
 Bradley & Baker, 155 East 44th St., New York, N. Y.  
 C. W. Brister & Son, Auburn, N. Y.  
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Company of North America.)  
 Brown & Bailey Condensed Milk Co., Nevins and Butler Streets, Brooklyn, N. Y.  
 Brown-Forman Distillery Co., Louisville, Ky.  
 George B. Brown, Ipswich, Mass.  
 Buckeye Cotton Oil Co., Cincinnati, Ohio.  
 C. E. Buell, Inc., 6 Beacon St., Boston, Mass.  
 C. W. Burckhalter, Inc., 177 Franklin St., New York, N. Y.  
 Butman Grain & Feed Co., Lynn, Mass.  
 Cairo Meal & Cake Co., Cairo, Ill.  
 California Mealalfa Co., Dixon, Cal.  
 A. B. Caple Co., Sta. A, Box 27, Toledo, Ohio.  
 Center Milk Products Co., Middlebury Center, Penn.  
 Chapin & Co., Hammond, Ind.  
 Checkerboard Elevator Co., St. Louis, Mo.  
 Clinton Co., Clinton, Iowa  
 Coles Co., Middletown, Conn.  
 Collis Products Co., St. Paul, Minn.  
 Commander-Larabee Corp., Minneapolis, Minn.  
 Community Feed Stores, Inc., South Deerfield, Mass.  
 G. E. Conkey Co., Cleveland, Ohio  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Continental Distilling Corp., 260 South Broad St., Philadelphia, Penn.  
 Copeland Flour Mills, Ltd., Midland, Ontario, Canada.  
 Corn Products Refining Co., 17 Battery Place, New York, N. Y.  
 Corno Mills Co., Prop., Three Minute Cereals Co., Cedar Rapids, Iowa.  
 Nicolas Courcy Grain Co., 11 Waverly St., Taunton, Mass.  
 Cover & Palm Co., 150 Middle St., Lowell, Mass.  
 E. A. Cowee Co., Fitchburg, Mass.  
 Chas. M. Cox Co., Boston, Mass. (Registered for Western Canada Flour Mills, Ltd., and Lake of the Woods Milling Co., Ltd.)  
 Curley Brothers, Wakefield, Mass.  
 Cutler Co., North Wilbraham, Mass. (Registered by St. Albans Grain Co.)  
 Dairymen's League Co-operative Association, Inc., 11 West 42nd St., New York, N. Y.  
 Decatur Milling Co., Inc., Decatur, Ill.  
 Delaware Mills, Inc., Deposit, N. Y. (Registered also for Squier & Co., Monson, Mass.)  
 Denver Alfalfa Milling & Products Co., Lamar, Col.  
 Frank Diauto, 87 Warren St., Randolph, Mass.  
 F. Diehl & Son, Inc., Wellesley, Mass.  
 Dietrich & Gambrill, Inc., Frederick, Md.  
 Donahue Stratton Co., Milwaukee, Wis.  
 Dreyer Commission Co., 300 Merchants' Exchange Bldg., St. Louis, Mo.  
 Duluth-Superior Milling Division of Standard Milling Co., Minneapolis, Minn.  
 J. L. Dunnell & Son, Bernardston, Mass.  
 Eagle Roller Mill Co., New Ulm, Minn.  
 East Bridgewater Farmers' Exchange, Inc., East Bridgewater, Mass.  
 Eastern Grain Co., Bridgewater, Mass.  
 Eastern States Farmers' Exchange, Box 1482, Springfield, Mass.  
 Eisemann & Co., Inc., Galveston, Texas.  
 Michael W. Ellis, 19 Walnut St., Peabody, Mass.  
 Elm City Creamery, Inc., 3 Pleasant St., Fairhaven, Mass.  
 Elmore Milling Co., Inc., Oneonta, N. Y.  
 John W. Eshelman & Sons, Lancaster, Penn.  
 Evans Milling Co., Indianapolis, Ind.  
 Everett, Aughenbaugh & Co., Security Bldg., Minneapolis, Minn.  
 Excelsior Milling Co., 712 Flour Exchange, Minneapolis, Minn.  
 Fairchild Milling Co., 1635 Merwin St., Cleveland, Ohio.  
 Fairmont Creamery Co., Omaha, Neb.  
 Farm Service Stores, Inc., Industrial Bldg., Boston, Mass.  
 Farmers Feed Co., 532 East 76th St., New York, N. Y.  
 Federal Mill, Inc., Lockport, N. Y.  
 Fernando Valley Milling & Supply Co., 336 I. W. Hellman Bldg., Los Angeles, Cal.  
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.  
 Fisher Flouring Mills Co., Harbor Island, West Waterway, Seattle, Wash.  
 Flory Milling Co., Inc., Bangor, Penn.

Fred A. Fountain, 355 Tremont St., Taunton, Mass.  
 Dean S. French, West Stoughton, Mass.  
 Paul Fuller & Sons, 8 Mooney Ave., Salem, Mass.  
 J. B. Garland & Son, 15 Grafton St., Worcester, Mass.  
 General Commodity Corp., Buffalo, N. Y.  
 General Mills, Inc., Chamber of Commerce Bldg., Minneapolis, Minn.  
 J. T. Gibbons, Inc., New Orleans, La.  
 W. K. Gilmore & Sons, Inc., Walpole, Mass.  
 Goode Grain Co., Lowell, Mass.  
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.  
 Grand Union Co., 233 Broadway, New York, N. Y.  
 D. H. Grandin Milling Co., Jamestown, N. Y.  
 Great Atlantic & Pacific Tea Co., New York, N. Y.  
 Green Acre Farms, Nazareth, Penn.  
 Hales & Hunter Co., 166 West Jackson Blvd., Chicago, Ill.  
 Frank B. Ham & Co., Ltd., 1506 Royal Bank Bldg., Toronto, Canada.  
 Wm. Hamilton & Son, Inc., Caledonia, N. Y.  
 Dwight Hamlin Co., Diamond Bank Bldg., Pittsburgh, Penn.  
 D. Harbeck, 405 Earl St., New Bedford, Mass.  
 Hecker-H-O Co., Inc., Buffalo, N. Y.  
 Hecker-Jones-Jewell Milling Division of Standard Milling Co., 503 Seneca St., Buffalo, N. Y.  
 W. D. Higgins Co., Framingham, Mass.  
 Hirst & Begley Linseed Works, 2013 Mendel St., Chicago, Ill.  
 D. B. Hodgkins' Sons, Gloucester, Mass.  
 Horvitz Grain Co., New Bedford, Mass.  
 R. B. Howlett, Amherst, Mass.  
 Hubinger Co., Keokuk, Iowa.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 International Milling Co., Minneapolis, Minn.  
 International Vegetable Oil Co., Inc., Memphis, Tenn.  
 Jaquith & Co., 305 Main St., Woburn, Mass.  
 Jersee Co., Minneapolis, Minn.  
 Joslin-Schmidt Corp., Lockland Station, Cincinnati, Ohio.  
 Kansas Flour Mills Corp., Kansas City, Mo.  
 Kasco Mills, Inc., Waverly, N. Y.  
 Kellogg Co., Battle Creek, Mich.  
 Kelloggs & Miller, Inc., Amsterdam, N. Y.  
 Spencer Kellogg & Sons, Inc., Buffalo, N. Y.  
 Kerr Chickeries, Inc., Frenchtown, N. J.  
 H. H. King Flour Mills Co., Minneapolis, Minn.  
 King Midas Mill Co., Minneapolis, Minn.  
 Kraft-Phenix Cheese Corp., 400 Rush St., Chicago, Ill.  
 Chas. A. Krause Milling Co., Milwaukee, Wis.  
 Lake of the Woods Milling Co., Ltd., Montreal, Canada. (Registered by Chas. M. Cox Co.)  
 J. T. Lampman & Co., Claverack, N. Y.  
 Larabee Flour Mills Co., Kansas City, Mo.  
 Larowe Milling Co., Box 68, North End Station, Detroit, Mich.  
 L. B. Lovitt & Co., Memphis, Tenn.  
 A. S. MacDonald Commission Co., 404 Grain & Flour Exchange, Boston, Mass.  
 Maine Fish Meal Co., Portland, Maine  
 Mann Bros. Co., Buffalo, N. Y.  
 Mansfield Milling Co., Mansfield, Mass.  
 Maple Leaf Milling Co., Ltd., Toronto, Canada (Registered by Traders Feed & Grain Co., Inc.)  
 Maritime Milling Co., Inc., 1009 Chamber of Commerce, Buffalo, N. Y.  
 Matheson Vail Co., 177 Milk St., Boston, Mass.  
 Mellin's Food Company of North America, 177 State St., Boston, Mass. (Registered for A. H. Brown & Bros.)  
 Merrimack Farmers' Exchange, Inc., Concord, N. H.  
 Midland Flour Milling Co., Kansas City, Mo.  
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.  
 Monti-Van Iderstine, Inc., 272 Hudson Ave., Brooklyn, N. Y.  
 Geo. Q. Moon & Co., Inc., Binghamton, N. Y.  
 Jas. F. Morse & Co., Somerville, Mass.  
 Morten Milling Co., 916 Cadiz St., Dallas, Texas.  
 Moseley & Motley Milling Co., Mill St., foot of Brown St., Rochester, N. Y.  
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.  
 National Mineral Products Co., Ltd., 830-832 Seventh St., San Francisco, Cal.  
 New England Brewery and Distillery Grain Co., Woburn, Mass.  
 New England Rendering Co., Brighton, Mass.  
 Niagara Falls Milling Co., Lockport, N. Y.  
 Northern Illinois Cereal Co., Lockport, Ill.  
 Northern Milk Corp., Adams, N. Y.  
 Northwestern Consolidated Milling Division of Standard Milling Co., Minneapolis, Minn.  
 Nowak Milling Corp., Hammond, Ind.  
 Ogden Grain Co., Utica, N. Y.  
 Thomas Page Mill Co., Topeka, Kan.  
 Palmer Grain Co., Palmer, Mass. (Registered by Park & Pollard Co.)  
 Philip R. Park, Inc., Naval Station, San Pedro, Cal.  
 Park & Pollard Co., 356 Hertel Ave., Buffalo, N. Y. (Registered also for Black Rock Milling Corp., and for Palmer Grain Co.)  
 George H. Parker Grain Co., Danvers, Mass.  
 Parrish & Heimbecker, Ltd., Board of Trade Bldg., Montreal, Canada.  
 Patent Cereals Co., Geneva, N. Y.  
 Pecos Valley Alfalfa Mill Co., Hagerman, N. M.  
 Penick & Ford Ltd., Inc., Cedar Rapids, Iowa.  
 Pillsbury Flour Mills Co., Minneapolis, Minn.  
 Maurice Pincoffs Co., 422 Cotton Exchange, Houston, Texas.  
 Postum Co., Inc., Battle Creek, Mich.  
 W. N. Potter Grain Stores, Inc., Greenfield, Mass.

Pratt Food Co., Inc., Elk St. and Abbott Rd., Buffalo, N. Y.  
H. C. Puffer Co., Springfield, Mass.  
Purina Mills. (Registered by Ralston Purina Co.)  
Quaker Oats Co., 141 West Jackson Blvd., Chicago, Ill.  
Ralston Purina Co., St. Louis, Mo. (Registered for Purina Mills.)  
John Reardon & Sons Co., Cambridge A, Mass.  
D. F. Riley, North Hatfield, Mass.  
Robin Hood Mills, Ltd., Moose Jaw and Calgary, Canada.  
Ronck & Bevis Co., 940-944 North Front St., Philadelphia, Penn.  
Reuben W. Ropes, 5 Hobart St., Danvers, Mass.  
Sigmond Rothschild Co., Houston, Texas.  
N. Roy & Son, Rear 618 Newport Ave., South Attleboro, Mass.  
Russell-Miller Milling Co., Minneapolis, Minn.  
Ryther & Warren, Belchertown, Mass.  
St. Albans Grain Co., St. Albans, Vt. (Registered also for Cutler Co.)  
St. Lawrence Flour Mills Co., Ltd., 2110 Notre Dame St., West, Montreal, Canada.  
Sheffield Farms Co., Inc., 524 West 57th St., New York, N. Y.  
Sherwin Williams Co., 101 Prospect Ave., Cleveland, Ohio.  
Smith Bodfish Swift Co., Vineyard Haven, Mass.  
James H. Smith, 102 Hale St., Haverhill, Mass.  
Sperry Flour Co., 195 Berry St., San Francisco, Cal.  
Scuier & Co., Monson, Mass. (Registered by Delaware Mills, Inc.)  
A. E. Staley Manufacturing Co., Decatur, Ill.  
John T. Stanley Co., Inc., 30th St. & North River, New York, N. Y.  
D. A. Stickell & Sons, Inc., Hagerstown, Md. (Registered also for Anchor Mills.)  
F. W. Stock & Sons, Hillsdale, Mich.  
Stratton & Co., Concord, N. H.  
Swift & Co., Union Stock Yards, Chicago, Ill.  
C. H. Symmes, Winchester, Mass.  
Syracuse Milling Co., P. O. Box 1141, Syracuse, N. Y.  
Tennant & Hoyt Co., Lake City, Minn.  
Texas Milling Co., Forth Worth, Texas.  
Tioga-Empire Feed Mills, Inc., Waverly, N. Y.  
Traders Feed & Grain Co., Inc., 736 Chamber Commerce, Buffalo, N. Y. (Registered for Maple Leaf Milling Co., Ltd.)  
Transit Milling Co., 406 Commerce Bldg., Galveston, Texas.  
Jacob Trinley & Sons, Inc., Linfield, Penn.  
Twin City Milk Producers Association, 2395 University Ave., St. Paul, Minn.  
Union Starch & Refining Co., Columbus, Ind.  
United Cooperative Farmers, Inc., Fitchburg, Mass.  
United Mills Co., Inc., Grafton, Ohio.  
Unity Feeds, Inc., 177 Milk St., Boston, Mass.  
Upper Hudson Rye Flour Mills, Inc., 7-9 Madison St., Troy, N. Y.  
Van Iderstine Co., Long Island City, N. Y.  
Van Vechten Milling Co., Inc., 196 Smith St., Rochester, N.Y.  
Victor Flour Mills, Inc., Pittsford, N. Y.  
Ward Dry Milk Co., St. Paul, Minn.  
C. P. Washburn Co., Middleboro, Mass.  
Wayne County Grangers Feed Corp., Clyde, N. Y.  
H. K. Webster Co., 10-32 West St., Lawrence, Mass.  
West-Nesbitt, Inc., Oneonta, N. Y.  
Western Canada Flour Mills, Ltd., Toronto, Canada. (Registered by Chas. M. Cox Co.)  
Whiting Milk Companies, 570 Rutherford Ave., Boston, Mass.  
Est. M. G. Williams, Taunton, Mass.  
Wilson & Co., Inc., 41st & Ashland Ave., Chicago, Ill.  
Stanley Wood Grain Co., Taunton, Mass.  
Worcester Grain & Coal Co., Worcester, Mass. (Registered one brand for Jersee Co.)





MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN NO. 76

DECEMBER, 1934

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Inspection of Agricultural  
Lime Products

By H. D. Haskins

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This is the twenty-third report on the inspection of agricultural lime products in Massachusetts. It gives the composition of the various products which have been sold in the State during the year. In case of the ground limestone products the mechanical analysis is also given.

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Massachusetts State College  
Amherst, Mass.



# INSPECTION OF AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1934

By H. D. Haskins, Official Chemist.<sup>1</sup>

## Manufacturers and Brands.

During 1934, twenty-three firms registered for sale in Massachusetts forty-five brands of lime products suitable for neutralizing acid soils and one brand of gypsum or land plaster. The products are grouped as follows:

Hydrated or slaked lime	23
Ground limestone	20
Oyster shell lime	1
Lime kiln ashes	1
	<hr/>
	45
Gypsum	1

With the exception of two brands of hydrated lime, all of the lime products registered have been analyzed and the results appear in this bulletin.

Most of the samples were drawn between the dates of April 1 and June 15, although several were secured during the early fall at seeding time and later when land was being plowed for the 1935 onion crop at which time much land is limed in the Connecticut Valley. The spring samples were taken by the same inspectors who drew the fertilizer samples and were taken from all over the state. We therefore believe that they are a fair representation of the lime products used as soil amendments for 1934. Ninety-eight samples, representing 44 brands, were drawn from stock in the possession of 85 agents or owners.

## Variations and Deficiencies in the Composition of Lime Products.

In limestone products calcium is usually associated with more or less magnesium; when the latter element is present in only small amounts the product is known as high calcium limestone; when the magnesium oxide runs to 20 per cent or over it is usually designated as dolomite. Both of these elements when in the form of either caustic or burned lime, hydrated or slaked lime, or carbonate (ground limestone) have the property of neutralizing or reducing soil acidity, the main purpose for which they are used as soil amendments. With this in mind a study of Table I shows no serious deficiencies among the hydrated lime products. It is true that several deficiencies are noted, yet they are of little significance when viewed from the standpoint of the compensating neutralizing value of the overrun of the companion element (magnesium oxide in case of calcium oxide shortage and calcium oxide in case of magnesium oxide deficiency).

The Snow Fluff Agricultural Hydrated Lime, manufactured by Brewer & Co., Inc., showed a deficiency of 3.93 per cent of magnesium oxide as compared with the guarantee. This was in part made up by an overrun of 2 per cent of calcium oxide, leaving a magnesium oxide deficiency which in terms of calcium oxide equivalent would amount to 3.46 per cent calcium oxide ( $3.93 \times 1.39 = 5.46 - 2 = 3.46$ ). This was the largest deficiency noted in this class of liming products.

No serious deficiencies occurred in the ground limestone products listed in

<sup>1</sup>Assisted by H. Robert DeRose, First Assistant Chemist; James T. Howard, C. L. Whiting, A. G. Brigham, and G. E. Taylor, Sampling Agents.

Table II. Some criticism, however, seems called for in connection with the degree of fineness to which at least four of the products were ground: these were manufactured by the Hoosac Valley Lime Co., Inc., D. U. Smith & Bro., Hazen Brothers, and Eastern States Farmers' Exchange. We should not lose sight of the fact that the fineness of any ground limestone or ground shell lime determines in no small measure its effectiveness in neutralizing soil acidity during a one- or two-year period. This is of particular significance when, as is sometimes the case, the handling and transportation charges equal or exceed the original cost of the product at the plant.

The inspection of ground limestone products shows that in some instances refuse burned lime known as "core" has been added. This in no way lessens the value of the product, but on the contrary increases the neutralizing value and should not add seriously to the discomfort of handling.

### Explanation of Tables of Analyses.

Table I, "Proportion of total oxides as carbonates." The data furnished in this column are calculated from an actual determination of carbon dioxide ( $\text{CO}_2$ ). Calcium or magnesium not in the form of carbonate is present either as hydrated lime (water- or air-slaked), burned lime (caustic or unslaked), or as basic silicate. It should be understood that all of the products listed in this table have at some time been burned, and the proportion of oxides present as carbonates indicates to what extent the product has absorbed carbonic acid from the air.

"Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and calcium. The figures in the "per cent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20.

Table II, in the column headed "Carbonates of calcium and magnesium" the calculation allows for the small amounts of calcium and magnesium combined as basic silicates; these are readily soluble in mineral acid solutions but obviously should not be classed as carbonates.

"Neutralizing value: per cent and pounds in one ton." In securing these data the degree of fineness to which the limestone has been ground is taken into consideration. When the products are so finely ground that all of the material will pass through a 20-mesh sieve, it is assumed that all of the calcium and magnesium oxides will become available in the soil within a five-year period. In the less finely ground products it is assumed that the oxides in that portion which is coarser than 20-mesh will be only 50 per cent effective during the same period.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass the various meshed sieves mentioned.

In both tables the figures in parentheses following the brand name show the number of samples collected and analyzed.

Table I. Hydrated or Slaked Lime and Lime Ashes.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		Proportion of Total Oxides as Car- bonates.	NEUTRALIZING VALUE EXPRESSED IN TERMS OF CALCIUM OXIDE.	
	Found.	Guar- anteed.	Found.	Guar- anteed.		Per Cent.	Pounds in One Ton.
<b>Brewer &amp; Co., Inc., 45 Arctic St., Worcester, Mass. (a)</b>							
Green Mountain Producto Agricultural Lime (3)	64.83	60.00	3.98	1.00	1/5	68.00	1360
Snow Pluff Agricultural Hydrated Lime (1)	72.00	70.00	1.07	5.00	1/41	73.60	1472
Lime Kiln Ashes (1)	46.99	42.00	4.23	none	5/6	51.32	1026
<b>Eastern States Farmers' Exchange, Springfield, Mass. (b)</b>							
Eastern States Hydrated Lime (1)	71.37	70.00	2.25	none	1/14	72.20	1444
<b>Burton K. Harris, Saylesville, R. I. (c)</b>							
Dexter Agricultural Lime (2)	53.16	50.00	19.84	20.00	1/16	78.51	1570
<b>Herzog Lime and Stone Co., Forest, Ohio</b>							
Herzog's White Lime (1)	48.85	47.20	31.21	32.90	1/25	89.02	1780
<b>Hoosac Valley Lime Co., Inc., Adams, Mass.</b>							
Adams Land Lime (1)	63.27	58.00	1.45	50	1/4	63.79	1276
<b>Lawrence Portland Cement Co., Thomaston, Maine</b>							
Dragon Mainrok Magnesian Agricultural Hydrated Lime (1).	66.05	65.00	6.15	4.00	1/11	71.50	1430
Dragon Mainrok Agricultural Hydrated Lime (4)	70.34	68.00	2.55	.20	1/14	71.36	1427
<b>Lee Lime Corp., Lee, Mass.</b>							
Lee Agricultural Hydrated Lime (4)	47.93	47.00	31.61	31.00	1/12	88.05	1761
Lee Agricultural Hydrated Lime (1)	47.19	47.00	32.16	31.00	1/16	91.12	1822
Lee Land Lime (2)	41.27	35.00	27.61	25.00	1/3	77.68	1554
<b>H. E. Millard, Annville, Penn.</b>							
Sweet Arrow Hydrated Lime (1)	67.86	70.00	2.38	1.75	1/5	67.86	1357
<b>Clifford L. Miller, West Stockbridge, Mass.</b>							
Monarque Agricultural Hydrated Lime (2)	62.11	60.00	6.79	4.00	1/9	73.60	1472

<b>New England Lime Co., Pittsfield, Mass. (d)</b>										
Agricultural Hydrated Lime (Adams Product) (2)	.	.	.	.	.	.	.	.	.	.
Nelco Agricultural Hydrated Lime (Canaan Product) (1)	.	.	.	.	.	.	.	.	.	.
Nelco Agricultural Hydrated Lime (Canaan Product) (1)	.	.	.	.	.	.	.	.	.	.
<b>Rockland &amp; Rockport Lime Corp., Rockland, Maine</b>										
R-R Land Lime Grade C (3)	.	.	.	.	.	.	.	.	.	.
R-R Land Lime Grade M (4)	.	.	.	.	.	.	.	.	.	.
Sanlime (1)	.	.	.	.	.	.	.	.	.	.
<b>United States Gypsum Co., 300 West Adams St., Chicago, Ill. (e)</b>										
U. S. G. Agricultural Hydrated Lime (2)	.	.	.	.	.	.	.	.	.	.
U. S. G. Red Top Hydrated Lime (2)	.	.	.	.	.	.	.	.	.	.
U. S. G. Agricultural Lime (1)	.	.	.	.	.	.	.	.	.	.
<b>Wm. Zinger Handy Patching Plaster Co., 1509 Pennsylvania Ave., Philadelphia, Penn.</b>										
Zinger's Handy Lime for Lawn, Garden, Etc. (1)	.	.	.	.	.	.	.	.	.	.
	69.13	50.00	2.22	1.50				1.13	72.76	1455
	47.48	47.00	32.09	30.00				1/18	90.14	1803
	46.99	47.00	31.08	30.00				1/12	87.62	1752
	65.01	60.00	2.81	.50				1/6	66.31	1326
	59.77	60.00	6.77	4.00				1/8	68.70	1374
	73.42	71.00	1.42	.50				1/41	72.20	1444
	70.61	70.00	1.91	none				1/16	71.50	1430
	71.13	70.00	1.16	none				1/11	72.76	1455
	65.08	60.00	1.19	none				1/3	67.30	1346
	48.13	48.00	34.16	31.70				1/11	91.13	1823

*a* Plant at Winooski, Vt.

*b* Plant at Farnams, Mass.

*c* Shipping point, Berkeley, R. I.

*d* Plants at Adams, Mass., and Canaan, Conn.

*e* Plants at Farnams, Mass., and Falls Village, Conn.

Table II. Ground Limestone and Oyster Shell Lime.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		CARBONATES OF CALCIUM AND MAGNESIUM		NEUTRALIZING VALUE EXPRESSED IN TERMS OF CALCIUM OXIDE.		MECHANICAL ANALYSIS (PER CENT).				
	Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.	Per Cent.	Pounds in One Ton.	Finer than 100-mesh.	Between 100 and 80-mesh.	Between 80 and 60-mesh.	Between 60 and 40-mesh.	Between 40 and 20-mesh.
American Agricultural Chemical Co., North Weymouth, Mass.													
Powmill Agricultural Limestone (3) (a)	47.65	45.00	6.08	5.00	90.07	90.00	52.86	1057	80.02	1.85	4.89	4.85	8.39
Fine Ground Magnesian Limestone (2) (b)	31.13	30.00	21.13	20.00	98.67	95.00	58.82	1176	89.28	5.76	1.49	1.44	2.03
Brewer & Co., Inc., 45 Arctic St., Worcester, Mass.													
Producto Agricultural Limestone (1) (c)	54.91	44.00	3.08	.50	81.75	90.00	57.77	1155	74.16	1.98	6.10	7.88	9.88
Dominion Lime Co., Lime Ridge, Quebec													
Dudswell Brand Agricultural Limestone (1) (d)	54.47	52.00	1.09	.20	94.78	94.00	53.98	1080	72.61	1.76	5.83	7.37	12.42
Eastern States Farmers' Exchange, Springfield, Mass.													
Eastern States Magnesian Limestone (2) (e)	31.44	29.00	21.66	20.00	95.14	95.00	58.34	1167	54.56	5.96	21.32	15.58	2.58
Eastern States Magnesian Limestone (3)	31.47	29.00	20.94	20.00	87.84	93.50	56.93	1139	80.13	3.43	8.85	5.37	2.22
Grangers Manufacturing Co., West Stock- bridge, Mass.													
Grangers Agricultural Limestone (6)	35.54	35.00	12.71	1.00	84.85	90.00	50.13	1003	76.05	2.15	7.91	6.32	7.57
Grangers Agricultural Limestone (1)	38.44	35.00	8.36	1.00	85.24	90.00	47.81	956	92.95	2.50	4.55	none	none
Hazen Brothers, 14 Lake St., Arlington, Mass.													
Ground Limestone (2)	54.42	53.71	.87	.51	98.93	99.21	54.26	1085	54.57	3.12	15.72	14.30	12.29
Hoosac Marble Co., North Adams, Mass.													
Ground Limestone (2)	54.68	53.00	.75	.78	<del>96.93</del> 91.80	96.44	52.46	1049	96.36	1.45	2.19	none	none
Hoosac Valley Lime Co., Inc., Adams, Mass.													
Hoosac Agricultural Limestone (1)	55.36	50.00	.72	.75	96.07	97.00	54.40	1088	37.98	3.10	13.74	12.85	32.33
Lawrence Portland Cement Co., Thomaston, Maine													
Dragon Mainrok Finely Ground Magnesian Limestone (1)	28.26	28.00	17.81	18.00	78.75	78.00	47.67	953	100.00	none	none	none	none
Dragon Mainrok Finely Ground High Calcium Limestone (1)	55.06	50.00	.51	.20	99.32	95.00	55.03	1101	99.56	.44	none	none	none

<b>Lee Lime Corp., Lee, Mass.</b> Lee Agricultural Pulverized Limestone (6) . . .	30.97	30.00	21.62	20.00	96.13	93.00	58.54	1171	91.40	1.72	3.40	1.26	.50
<b>Limestone Products Corp. of America, Newton, N. J.</b> Lime Crest Pulverized Calcite (Limestone) (3) . .	43.18	34.00	6.85	1.00	90.27	90.00	50.34	1007	91.70	1.70	4.00	1.35	1.25
<b>Clifford L. Miller, West Stockbridge, Mass.</b> Monarque Agricultural Ground Limestone (1) . .	42.36	35.00	9.74	6.00	92.20	90.00	53.28	1066	72.44	2.40	8.45	6.34	10.37
<b>Producers Sales Co., 144 Water St., South Norwalk, Conn.</b> Sealsight Brand Oyster Shell Dust (1) . . . . .	48.64	45.00	.93	.75	88.74	77.00	49.42	988	83.55	1.40	5.52	4.26	5.27
<b>Rockland &amp; Rockport Lime Corp., Rockland, Maine</b> R-R Ground Limestone (4) . . . . .	51.52	48.00	2.07	1.00	93.74	92.00	52.23	1045	84.46	2.29	6.40	3.78	3.07
R-R Ground Limestone Grade M (3) . . . . .	33.17	30.00	19.49	18.00	96.74	94.00	57.14	1143	81.97	3.83	8.54	4.16	1.50
<b>D. U. Smith &amp; Bro., Ashley Falls, Mass.</b> Ashley White Agricultural Limestone (5) . . . . .	31.47	30.00	21.83	21.00	95.85	98.00	58.19	1164	48.68	3.80	13.85	13.27	20.40
<b>Solvay Process Co., Syracuse, N. Y.</b> Solvay Pulverized Limestone (1) (f) . . . . .	48.93	50.00	3.26	1.50	93.55	92.40	51.88	1038	62.86	2.21	8.78	10.21	15.94
<b>United States Gypsum Co., 309 West Adams St., Chicago, Ill.</b> U. S. G. Agricultural Limestone (3) (e) . . . . .	31.34	29.00	21.25	20.00	93.53	93.50	57.49	1150	65.73	3.86	13.76	13.43	3.17
<b>Vernarco Lime Co., West Rutland, Vt.</b> Vernarco Agricultural Pulverized Limestone (1)	54.19	54.00	1.14	.48	93.85	97.36	53.42	1064	93.18	1.97	4.14	.71	none

a Plant at North Pownal, Vt.  
b Plant at Ashley Falls, Mass.  
c Plant at Winooski, Vt.  
d Plant at Dudswell Junction, Quebec, Canada.  
e Plant at Falls Village, Conn.  
f Plant at Jamesville, N. Y.

Table III. Gypsum or Land Plaster.

Name of Manufacturer and Brand.	Calcium Oxide (CaO).		Calcium Sulfate (CaSO <sub>4</sub> ).		Calcium and Magnesium Carbonates Found.
	Found.	Guar- anteed.	Found.	Guar- anteed.	
United States Gypsum Co., 300 West Adams St., Chicago, Ill. U. S. G. Ben Franklin Agricultural Gypsum (2) . . . . .	32.75	30.00	75.57	64.50	4.35

NOTE: The product carried 18.67% of water. The small amount of calcium and magnesium carbonates present would to a slight extent neutralize sour soils; the calcium sulfate would not be effective for this purpose.

### Deciding the Lime Requirements of the Soil and the Purchase of Lime Products.

In securing information as to the amount of lime needed on any particular soil for a given crop, the common practice is to call in the County Agent or the Extension Agronomist, who draws the sample, preferably by means of a soil auger, and makes the test. Oftentimes, however, inquiry is made by the farmer as to how he shall proceed in securing a representative sample of his soil for testing. Assuming that a five-acre tract is to be sampled; have at least ten different samples drawn from the area, each sample to be about uniform in weight. Select the places to be sampled so that two of them will be located on each acre and so that the ten places will, so far as possible, be a fair representation of the whole area. Remove all vegetable matter from the surface to be sampled. It is immaterial what tools are employed in taking the sample: it may be a soil auger, trowel or shovel. Each sample should represent a thin section from the top down as deep as one would naturally plow. When a sufficient number of samples have been drawn and placed in a pail or other container, thoroughly mix the whole lot, breaking up the large lumps and continuing the mixing until a thoroughly uniform mass is secured. Fill a clean quart jar with the mixture, taking small portions from the whole area of the mixed mass. Take the sample to the County Agent, Extension Agronomist, or anyone who has the proper equipment and experience to make the test and who can advise as to the lime application necessary for the crop to be grown.

In purchasing lime in large quantities it is good practice to ask for quotations from several firms, basis f.o.b. at the farm in case truck delivery is most economical, if not, then f.o.b. at railroad station nearest to the farm. In cases where indications of magnesium deficiencies in the soil have been noted through a lack of green coloring matter in the leaves, or a whitening of the leafy structure of plants, a lime product high in magnesium oxide should be selected. As previous lime bulletins have furnished examples for calculating the most economical lime product to buy, further information along this line seems unnecessary at this time.

7-10-35

# MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 77

FEBRUARY, 1935

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## Seed Inspection

By F. A. McLaughlin

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This Report, the seventh in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1934 by the Commissioner of Agriculture, who is named in the Act as Administrative Officer (Acts and Resolves of 1927, Chapter 274.)

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Massachusetts State College  
Amherst, Mass.



## ANNOUNCEMENT

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any resident firm or citizen of Massachusetts.

Units are rated as follows:

	Units
Purity analysis (red clover, timothy, etc.).....	1
Purity analysis (bluegrass, orchard grass, etc.).....	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture).....	4-10
Examination for noxious weeds (4 oz. or fraction thereof) of samples not mixtures.....	1
Examination for noxious weeds (4 oz. or fraction thereof) of mixtures.....	4-10
Identification of seed or plant.....	1
Cleaning tobacco seed (4 oz. or fraction thereof).....	2
Germination tests (4 x 100 seeds, of any seed not chaffy or requiring a purity test).....	1
Germination tests (soil, 2 x 100 seeds).....	1
Germination tests (chaffy grasses or seeds requiring purity analysis).....	2-4

Fees for work in excess of the ten free units allowed are as follows:

- Germination test except for grasses other than timothy, but including clovers and alfalfa, thirty cents each.
- Germination tests of grasses except timothy, fifty cents each.
- Purity analyses of cereals, fifty cents each.
- Purity analyses of timothy, and all other kinds of crop seeds, except grasses, seventy-five cents each.
- Purity analyses of grasses and of all mixtures of not more than two kinds of agricultural seeds, one dollar each.
- Purity analyses of special mixtures, including lawn grasses and pasture mixtures, a charge sufficient to cover the actual cost of working the sample, the amount of such fee depending entirely upon the character of the sample submitted for test, minimum charge one dollar and twenty-five cents.

In no case will final report be rendered until all fees are paid.

# SEED INSPECTION

By F. A. McLaughlin<sup>1</sup>

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This bulletin gives the results of analysis of official seed samples, collected by the State Department of Agriculture during the year 1934 from the open markets in 112 towns and cities of Massachusetts, and analyzed at the Seed Testing Laboratory of the Massachusetts Agricultural Experiment Station at Amherst. Between October 1, 1933, and October 1, 1934, the Seed Laboratory analyzed 1,402 samples, of which 732 were collected by the State Department of Agriculture, 289 submitted by dealers and farmers, and 185 by the Rhode Island Department of Agriculture; 196 were purchased from wholesalers for special tests.

This bulletin also contains results of field tests for trueness to types of 300 samples of sweet corn, and 139 lots of the following vegetables: beans, beets, carrots, cucumbers, lettuce, onions, parsnips, radish, spinach, squash and turnips, conducted by the Department of Vegetable Gardening; also notes on the relation of seed-borne diseases observed in laboratory germination of sweet corn to emergence in the field.

## SUMMARY OF RESULTS

### Alfalfa to Timothy

The following table of analysis covering the 165 samples of seed in this group shows that again, as in former years, the most common violation of the seed law is the lack of certain required information on the label. This information was lacking, wholly or in part, for 61 samples (36.97%). Other deficiencies shown are 27, or 16.36%, below in germination; 5, or 3.03%, with excessive weed seed; and 19, or 11.51%, below in purity. In all, 95 samples (57.57%) of this group either did not comply with the label requirements or were not up to guarantee, even when proper tolerance allowances were made.

### Mixtures of Not More Than Two Lots of Seeds

No samples declared as such were taken by inspectors. Five samples, however, sold for pure seed of a single kind, were found to be mixtures of two sorts of seed. The table shows them otherwise deficient.

### Special Mixtures

Forty-one samples were analyzed in this group. Fifteen (36.58%) complied with requirements of the law in every respect. The remaining twenty-six were only partially labeled or were found not to comply with statements as labeled.

### Vegetable Seed

A larger number of samples of vegetable seed was taken than formerly. Each of the 521 samples tested met the label requirements of the law. On the whole the quality of seed as shown by germination is equal to that of any previous collection of official samples tested in this laboratory; yet 199, or 38.20% of the samples, show germination below the standards required by law in

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<sup>1</sup>Miss Jessie L. Anderson served as seed analyst for a period of three months; Miss Margaret E. Nagle resigned September 1, 1934.

many states (Seed Control Bulletin 56, 1930, page 4). This record shows much to be desired in quality of many vegetable seeds sold in Massachusetts. One cause of the poor showing is the practice among retailers of offering for sale seed which has been in their possession for one or more years. Seeds of certain varieties may retain satisfactory viability for several years if properly stored, but other kinds lose a large part of their viability in one year. Where old seed is noted in the tables, we believe the wholesaler should be for the most part absolved from blame.

### Explanation of Tables

In these tables the seeds are listed in alphabetical order by groups, each group containing only those seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. Section 261-A of the Acts and Resolves of 1927, Chapter 274, defines the group from Alfalfa to Timothy, inclusive; Section 261-B, Mixtures; Section 261-C, Special Mixtures; and Section 261-D, Vegetables.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F", what was found in the laboratory analysis. Attention is called to certain irregularities by the following:

The asterisk (\*) shows violation in labeling.

Boldface type indicates low purity, low germination, excessive weed seed, or excessive inert material, depending upon the column in which it is found.

Other deficiencies are enumerated as follows:

- (1) Noxious weeds found.
- (2) Old seed.
- (3) Ingredient found, but not declared.
- (4) Ingredient declared, but not found.
- (5) Ingredient declared, but percentage found after adding proper tolerance is less than 5%.
- (6) Term not specific.

The letter "R" after the germination percentage in the table of vegetable seeds indicates that the sample has received one or more retests.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except in those tables which list seeds falling under sections of the law not requiring purity or germination on the label. For the application of "Purity Tolerance", the sample is considered as made up of two component parts: (1) the component being considered, and (2) the balance of the sample. The tolerance in percentage allowed for each component shall be two-tenths of one per cent (0.2%) plus twenty per cent (20%) of the lesser of the two parts. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

<i>Given Germination</i>	<i>Allowable Variation (%)</i>
90 or over.....	6
80 or over, but less than 90.....	7
70 or over, but less than 80.....	8
60 or over, but less than 70.....	9
Less than 60.....	10

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>ALFALFA</b>							
A- 1	FARM SERVICE STORES, INC., Boston, Mass. Alfalfa, Idaho Certified Grimm, Lot No. 2009.....	99.83 99.68	.11 .17	— .15	— .00	91 87	2/33 5/34 (R)
A- 2	PARK & POLLARD CO. Boston Grimm Alfalfa, Lot No. 27-729..... Palmer Grain Co., Palmer	99.26 99.38	.26 .15	— .14	— .33	79-15 74-17	11/33 5/34
A- 3	WM. G. SCARLETT & CO., Baltimore, Md. Alfalfa, Kansas Lot No. 5468A..... Webster Grain Co., Webster	99.50 99.76	.25 .05	— .12	— .07	90 91-7	3/34 5/34
A- 4	STANFORD SEED CO., Buffalo, N. Y. Alfalfa, Lot No. 6676..... Geo. Methe Co., Springfield	99.00 98.85	.10 .13	— .08	— .94	78-16 80-11	12/33 5/34
A- 5	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Alfalfa, Grimm..... Axel Madsen, Southampton	99.50 99.72	.07 .04	— .24	— .00	60-31 73-14	2/34 5/34
<b>BARLEY</b>							
A- 7	BARBER & BENNETT, INC., Albany, N. Y. Barley, Alpha 2-Rowed, Lot No. 51544..... John S. Wolfe Co., Pittsfield	96.00 94.39	— .00	— 1.11	4.00 4.50	98 96	4/34 6/34 (R)
A- 6	ALBERT DICKINSON CO., Chicago, Ill. Barley, Six Row, Lot No. 071745..... H. C. Puffer, Springfield	98.50 99.38	.01 .02	— .39	— .21	90 89	4/34 6/34
<b>BENT GRASS</b>							
A- 8	THOMAS W. EMERSON CO., Boston, Mass. Bent grass, Astoria..... Elwood Adams, Inc., Worcester	99.00 99.12	.10 .10	— .78	— .00	90 89	3/34 6/34
A- 9	Colonial Bent..... Hutchinson Hardware Co., Lynn	97.93 98.53	.01 .10	— 1.37	— .00	93 84	3/34 6/34

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>BLUEGRASS</b>							
A-12	THOMAS W. EMERSON CO., Boston, Mass. Kentucky Bluegrass	88.00 (F.)	.07 .20	.15	.08	88 85	3/34 6/34 (R)
A-13	Grass, Kentucky Bluegrass. Stoughton Hardware Co., Stoughton	88.00 (F.)	.07 .39	.08	.10	88 81	3/34 6/34
A-11	WILLIAM G. SCARLETT & CO., Baltimore, Md. Kentucky Bluegrass	* (F.)	* .22	.14	.02	* 62	3/34 6/34
A-14	STANFORD SEED CO., Buffalo, N. Y. Kentucky Bluegrass, Lot No. 3752 (2) Burlingame & Darbys Co., North Adams	83.80 81.38 (F.)	.40 .29	.18	.10	80 67	2/33 6/34
A-15	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Choice Kentucky Bluegrass (2) Farm Service Stores, Inc., Waltham	84.18 83.69 (F.)	.29 .87	.15	.00	80 64	11/33 6/34
A-16	Kentucky Bluegrass. Foster-Farrar Co., Northampton	88.75 85.19 (F.)	.96 .64	.14	.00	80 68	2/34 6/34 (R)
<b>BUCKWHEAT</b>							
A-17	FARM SERVICE STORES, INC., Boston, Mass. Japanese Buckwheat Merriam Rolph Grain Stores, Fitchburg	* (F.)	* .13	.76	.22	* 70	* 6/34
A-18	ROSS BROS. CO., Worcester, Mass. Japanese Buckwheat Ross Bros., Co., Worcester, Mass.	99.94 99.96 (F.)	.00	.04	.00	95 95	3/34 6/34
A-19	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Japanese Buckwheat W. G. Pearce Co., Fall River	98.00 99.61 (F.)	.00	.39	.00	90 98	10/33 6/34
<b>ALSIKE CLOVER</b>							
A-20	THOMAS W. EMERSON CO., Boston, Mass. Alsike Clover A. H. & H. L. Gates, Palmer	98.00 96.11 (F.)	.15 79	.20	2.90	90 84	3/34 5/34 (R)

A-21	FARM SERVICE STORES, INC., Boston, Mass. Alsike Clover Merriam Rolph Grain Store, Fitchburg	* 97.35	— .55	— 1.44	* 31-1	* 5/34
A-24	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Alsike Clover W. G. Pearse Co., Fall River	* 98.04 97.96	— .83	— .79	75-14 73-10	7/33 6/34
A-25	Pan-American Alsike Clover Pierce Hardware Co., Taunton	* 98.11 98.92	— .34	— .44	84-11 78-11	1/34 6/34
A-26	Alsike, Fancy J. W. Smith, West St., Ware	* 98.00 97.77	— .38	— 1.28	81-9 79-11	1/33 6/34
A-27	Alsike Clover United Coop. Farmers, Fitchburg	* 98.44 98.33	— .24	— .71	80-13 77-9	1/34 5/34 (R)
RED CLOVER						
A-28	JOSEPH BRECK & SONS CORP., Boston, Mass. Red Clover Swift Bros., Easton	* 98.55	— .23	— .52	* 77-4	* 6/34
A-29	Clover, Prime Red Shattuck Store Co., Inc., Groton, Mass.	* 98.00 99.74	— .08	— .02	92 92-3	* 6/34
A-31	ALBERT DICKINSON CO., Chicago, Ill. Red Clover, Lot No. B29 H. C. Puffer, Springfield	* 99.00 99.64	— .00	— .28	95 94-1	3/34 5/34
A-32	EASTERN STATES FARMERS EX., Springfield Clover, Red Medium Greenfield Farmers Coop. Ex., Greenfield	* 99.62 99.67	— .23 .15	— .13	90-5 94-4	12/33 6/34
A-33	THOMAS W. EMERSON CO., Boston, Mass. Red Clover A. H. & H. L. Gates, Palmer	* 97.00 99.85	— .07	— .08	92 80.5-16	3/34 6/34
A-34	Red Clover Bartlett & Dow Co., Lowell	* 99.00 99.52	— .18	— .00	90 76-18	6/33 6/34
A-35	Choice Red Clover A. H. Whidden & Son, Inc., Peabody	* 99.30 86.33	— 12.78	— .54	94 75-3	3/33 6/34
A-36	Red Clover (2) Bradway's News Room, 162 Main St., Monson	* 97.81 97.97	— .61	— .41	87.5-4 68-2	4/30 6/34

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
RED CLOVER — Concluded							
A-37	FARM SERVICE STORES, INC., Waltham Fancy Dom. R. Med. R. Clover Farm Service Stores, Inc., Waltham	99.28 99.23	.06 .20	— .23	— .34	90 91-2	2/33 6/34
A-38	FARM SERVICE STORES, INC., Boston, Mass. Red Clover Merriam Rolph Grain Store, Fitchburg	* 99.51	* .07	— .14	— .28	* 92-3	* 6/34
A-39	HOLBROOK MARSHALL, Keene, N. H. Red Clover Wright & Fletcher, Westford	99.00 99.24	.30 .32	— .07	— .37	94 91-2	3/33 6/34
A-40	PERRY SEED CO., Boston, Mass. Clover, Medium Red G. F. Bunker, Brighton	98.00 99.04	* .20	— .38	— .38	93 90-4	* 6/34
A-42	SANFORD SEED CO., Greene, N. Y. Red Clover T. W. Pierce Hardware Co., Middleboro	* 99.26	* .12	— .06	— .56	* 92-5	* 6/34
A-30	WILLIAM G. SCARLETT & CO., Baltimore, Md. Red Clover J. O. Neill Hardware Co., Fall River	* 99.31	* .40	— .20	— .09	* 88-8	* 6/34
A-43	STANFORD SEED CO., Buffalo, N. Y. Red Clover, Lot No. 6288 Burlingame & Darbys Co., North Adams	99.29 99.15	.38 .26	— .14	— .45	86-8 93-1	* 6/34
A-44	N. WERTHEIMER & SONS, Ligonier, Ind. Clover, Red Medium, Lot No. 33311 W. N. Potter Grain Stores, Orange	98.03 96.88	.47 1.05	.20 .41	1.30 1.66	87-5 94-2	1/34 6/34 (R)
A-45	Red Clover, Lot No. 33307 Pittsfield Grain Co., Pittsfield	95.56 93.81	1.24 1.60	.70 .67	2.50 3.92	88.5-8 93-2	1/34 6/34
A-46	Clover, Medium Red, Lot No. 9556 The Cutler Co., No. Wilbraham	95.56 93.77	1.24 1.41	.70 .70	4.02 4.12	88.5-8 91-2	1/34 6/34 (R)

A-131	Red Clover Medium, Lot No. 32306 (2). W. N. Potter Grain Co., Athol	.....	(L. (F.	98.52 96.67	* 1.16	.58	.72 1.60	90 79	2/33 6/34 (R)
A-47	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Red Clover, Pan. Am. Domestic Medium. Knight Grain Co., Newburyport	.....	(L. (F.	99.42 99.44	.18 .10	— .20	— .26	94 92.5-1	4/33 6/34
A-48	Pan-American Red Clover. United Coop. Farmers, Fitchburg	.....	(L. (F.	99.42 99.37	.18 .27	— .18	— .18	94 92-5	4/33 6/34
A-49	Red Clover. Harry Seder, Webster	.....	(L. (F.	94.01 99.07	1.62 .36	— .04	— .53	88-1 89-1	2/33 6/34
A-41	UNKNOWN Red Clover. H. B. Blye & Co., Woburn	.....	(L. (F.	* 99.72	* .18	— .06	— .04	* 89-6	/34 6/34
SWEET CLOVER									
A-50	BARBER & BENNETT, INC., Albany, N. Y. Sweet Clover, Lot No. 2517. Berkshire Coal & Grain Co. White Blossom Sweet Clover Total Melilotus, Spp.	.....	(L. (F.	99.62 97.17W 2.51Y 99.68	.10 .14	— .08	— .10	85-12 80-9	11/32 6/34
A-53	EASTERN GRAIN CO., Bridgewater White Sweet Clover. Found Red Clover West Bridgewater Grain Co., West Bridgewater	.....	(L. (F.	* 96.37	* .81	— .94	— 1.88	* 4-0	* 6/34
A-51	N. WERTHEIMER & SONS, Buffalo, N. Y. White Sweet Clover, Lot No. 31400 (2). W. N. Potter Grain Stores, Springfield	.....	(L. (F.	99.80 99.27W .35Y 99.62	.12 .20	.08 .16	— .02	90 57-2	1/32 6/34
Total Melilotus Spp.									
A-52	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Sweet Clover, White Blossom. United Coop. Farmers, Inc., Fitchburg Total Melilotus Spp.	.....	(L. (F.	99.50 98.13W 1.33Y 99.46	.23 .08	— .46	— .00	62-29 53-10	1/32 6/34



## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Crop Seed %	Other Seed %	Germi- nation %	Date of Test
<b>WHITE CLOVER</b>								
A-54	BARBER & BENNETT, INC., Albany, N. Y. White Clover, Lot No. 2506 H. C. Puifer, 194 Lyman St., Springfield	98.40 98.02	.45 .55	.50 .60		.65 .83	92 93.2	12/33 6/34
A-55	JOSEPH BRECK & SONS, CORP., Boston, Mass. White Clover J. H. Fairbanks & Co., Bridgewater	* 93.85	* .35	— .27	— .53	— .86.4	* 86.4	3/34 6/34
A-56	White Clover, Breck's Henry L. Sawyer, Newton Highlands	* 97.57	* .26	— .99	— 1.18	— 89.7	* 89.7	* 6/34
A-58	THOMAS W. EMERSON CO., Boston, Mass. White Clover Bradway's News Room, Monson	* 96.40	* .53	— .73	— 2.34	— 75.14	* 75.14	* 6/34
A-59	White Clover W. R. Hill Hardware, Andover	98.00 98.72	.26 .41	— .64	— .23	— 80.15	96 80.15	3/34 6/34
A-60	PERRY SEED CO., Boston, Mass. White Dutch Clover G. F. Bunker, Brighton	97.00 98.72	.32	— .43	— .53	— 90	90 81.13	* 6/34
A-57	WILLIAM G. SCARLETT & CO., Baltimore, Md. White Clover J. O. Neill Hardware Co., Fall River	* 96.32	* .74	— .17	— 2.77	— 85.9	* 85.9	3/34 6/34
A-61	STANFORD SEED CO., Buffalo, N. Y. White Clover Burlingame & Darbys Co., North Adams	* 96.39	* 1.22	— .78	— 1.61	— 82.9	* 82.9	* 6/34
A-63	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. White Clover Farm Service Stores, Inc., Waltham	98.31 98.40	.52 .40	— .31	— .89	— 91.2	90 91.2	11/33 6/34
A-64	White Clover Foster-Farrar Co., Northampton	96.50 96.64	* 1.40	— .37	— 1.59	— 84	84 78.9	* 6/34
A-65	White Clover Peirson Hardware Co., Pittsfield	98.00 97.78	.65 .97	— .43	— .82	— 76.14	76.14 82.10	3/34 6/34

## FIELD CORN

A-66	DELTA SALES CO., Delta, Penn. Field Corn, Big K, Sweepstakes, Lot No. 83 W. N. Potter Grain Stores, Springfield	99.00 100.00	— .00	— .00	90 92	4/34 7/34
A-67	EASTERN STATES FARMERS EX., Springfield, Mass. Corn, Lancaster Sure Crop..... Eastern States Farmers Ex., Worcester	99.50 100.00	— .00	.50 .00	95 92	1/34 7/34
A-68	O. & M. SEED CO., Green Springs, Ohio Corn, Leaming..... Eastern Grain Co., Bridgewater	99.00 99.95	— .00	— .05	92 80	2/34 7/34
A-69	Field Corn, Leaming..... The Ware Grain & Coal Co., Ware	99.00 99.96	— .00	— .04	92 78	2/34 7/34
A-71	Corn, Leaming..... Cutler Grain & Coal Co., Palmer	99.00 99.90	— .00	— .10	92 83	2/34 7/34
A-70	THE PAGE SEED CO., Greene, N. Y. Field Corn, Flint..... Carr Hardware Co., Pittsfield	* 99.81	— .00	— .07	* 96	* 7/34
A-72	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Field Corn, Virginia Eureka..... Axel Madsen, Southampton	98.00 99.95	— .00	— .05	90 94	2/34 7/34
A-73	Field Corn, Lancaster Sure Crop..... Axel Madsen, Southampton	98.00 98.80	— .00	— 1.19	90 90	1/34 7/34
A-74	S. D. WOODRUFF & SONS, Orange, Conn. Field Corn, Woodruff Select Beauty..... United Coop. Farmers, Fitchburg	* 99.76	— .00	— .24	95 92	2/34 7/34
FESCUES						
A-77	THOMAS W. EMERSON CO., Boston, Mass. New Zealand Fescue..... Stoughton Hardware Co., Stoughton	98.49 98.51	.19 .43	— .48	94 76	/33 6/34
A-75	STANFORD SEED CO., Buffalo, N. Y. Red Fescue, Lot No. 3594..... R. E. Faulkner, Palmer	91.56 94.08	.54 .14	— 5.64	80 0	2/32 6/34
A-76	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Sheep's Fescue..... J. B. Shiley & Son, Ware	90.89 90.07	2.09 1.59	— 7.18	85 84	3/34 6/34

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
FESCUES—Concluded							
A- 78	New Zealand Chewings Fescue. Hutchinson Hardware Co., Lynn	98.00 (L. F.) 99.03	.14 .09	— .75	— .13	70 14	2/33 6/34
MANGELS							
A- 79	JOSEPH BRECK & SONS CORP., Boston, Mass. Mangel Beets A. H. Whidden Sons, Inc., Peabody	* 98.85 (F.)	— .00	— 1.15	— .00	* 80	* 7/34
A- 80	Mangels, Long Red. Franklin D. Williams, Taunton	* 99.52 (F.)	* .02	— .40	— .06	* 83	* 7/34
A- 81	THOMAS W. EMERSON CO., Boston, Mass. Mangel Beets, Mammoth Long Red. Gruener Hardware Store, Fitchburg	98.00 (L. F.) 99.11	* .05	— .84	— .00	88 95	/34 7/34
A- 82	CHAS. C. HART SEED CO., Wethersfield, Conn. Mangel Beets, Yellow. C. F. Page Co., Athol	* 96.18 (F.)	* .02	— 3.64	— .16	* 90	* 7/34
A- 83	THE PAGE SEED CO., Greene, N. Y. Mangel, Long Red. Harry Seder, Webster	* 99.18 (F.)	* .05	— .52	— .25	* 64	/34 7/34
A- 84	F. H. WOODRUFF & SONS, Milford, Conn. Mangel, Mammoth Long Red S. Allen & Sons, Greenfield	* 96.62 (F.)	— .00	— 3.24	— .14	86 84.5	* 7/34
GOLDEN MILLET							
A- 86	ALBERT DICKINSON CO., Chicago, Ill. Golden Millet (2) Fitchburg Hardware Co., Fitchburg	99.20 (L. F.) 98.45	.26 .70	— .62	— .23	93 66	1/29 6/34
A- 87	ROSS BROS. CO., Worcester, Mass. Golden Millet, Tennessee Ross Bros., Co., Worcester, Mass.	99.75 (L. F.) 99.59	* .06	— .35	— .00	83 68	12/33 6/34

## HUNGARIAN MILLET

A-93	EASTERN GRAIN CO., Bridgewater Hungarian Millet..... West Bridgewater Grain Co., West Bridgewater	(L. (F.	* 98.19	.14	- 1.38	- 29	* 48	* 6/34
A-88	THOMAS W. EMERSON CO., Boston, Mass. Hungarian Millet..... Bradway's News Room, Monson	(L. (F.	99.00 98.83	.10 1.05	- 1.12	- 00	96 92	1/34 6/34 (R)
A-89	N. WERTHEIMER & SONS, Ligonier, Ind. Hungarian Millet, Lot No. 33700..... Smith Feed Co., Westfield	(L. (F.	99.00 98.87	.80 .96	.20 .17	- 00	84 77	1/34 6/34
A-90	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Hungarian Millet..... Geo. Methe, Springfield	(L. (F.	99.64 99.78	.28 .13	- .09	- 00	70 63	1/34 6/34
A-91	Hungarian Millet..... Gruener Hardware Store, Fitchburg	(L. (F.	99.00 98.96	.53 .52	- .20	- .32	90 90	5/32 6/34
A-92	Hungarian Millet..... Knight Grain Co., Newburyport	(L. (F.	99.04 99.07	.31 .40	- .51	- 02	88 79	4/33 6/34
JAPANESE MILLET								
A-94	JOSEPH BRECK & SONS CORP., Boston, Mass. Japanese Millet..... Whitcomb-Carter Co., Beverly	(L. (F.	98.00 98.53	* 1.13	- .34	- 00	85 84.5	* 6/34
A-95	EASTERN STATES FARMERS EX., West Springfield, Mass. Millet, Japanese New York..... Eastern States Farmers Ex., Worcester	(L. (F.	98.75 99.13	1.09 .83	.16 .02	Trace .02	90 92	11/33 6/34
A-96	WILLIAM G. SCARLETT & CO., Baltimore, Maryland Japanese Millet, Lot No. 744-A..... Henry L. Sawyer, Framingham	(L. (F.	97.00 96.98	2.50 2.69	- .33	- 00	90 64	5/33 6/34
A-97	STANFORD SEED CO., Buffalo, N. Y. Japanese Millet, Lot No. 5201..... Harding Street Grain Stores, Worcester	(L. (F.	99.02 98.32	.92 1.64	- .04	- 00	94.25 93	1/34 6/34
A-98	N. WERTHEIMER & SONS, Buffalo, N. Y. Japanese Millet..... Cutler Coal & Grain Co., Palmer	(L. (F.	98.60 98.38	.98 1.36	- .22	- 04	88 84	1/34 6/34

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
JAPANESE MILLET — Concluded							
A-99	Japanese Millet, Lot No. 33701..... W. N. Potter Grain Stores, Springfield	98.66 98.32 (F.)	.98 1.28	.06 .40	— .00	88 84	1/34 6/34
A-100	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Japanese Millet..... Geo. Methe, Springfield	98.49 98.76 (F.)	1.33 1.12	— .12	— .00	90 97	1/34 6/34
OATS							
A-101	BARBER & BENNETT, INC., Albany, N. Y. Oats, Choice Northwestern, Lot No. 4434..... Geo. Methe, Springfield	98.50 96.40 (F.)	* .24	— .25	.050 3.11	97 97	4/34 7/34
A-102	BERKSHIRE COAL & GRAIN CO., North Adams, Mass. Oats, Swedish Type..... Checkerboard Feed Store, Pittsfield	98.00 98.58 (F.)	* .04	— .66	— .72	95 97	* 7/34
A-103	BUCKINGHAM SEED CO., Buckingham, Ohio Oats, Swedish Type..... Berkshire Coal & Grain Co., North Adams	98.00 98.24 (F.)	— .00	— .66	— 1.10	95 94	* 7/34
A-108	EASTERN GRAIN CO., Bridgewater Seed Oats..... West Bridgewater Grain Co., West Bridgewater	98.00 99.59 (F.)	* .13	— .28	— .00	95 89	— 7/34
A-104	EASTERN STATES FARMERS EX., Springfield, Mass. Oats, Selected..... Eastern States Farmers Ex., Worcester	98.65 99.06 (F.)	.08 .00	1.27 .94	.65 .00	86 89	3/34 7/34
A-105	THOMAS W. EMERSON CO., Boston, Mass. Oats..... Carr Hardware Co., Pittsfield	* 99.75 (F.)	* .10	— .12	— .03	* 97	* 7/34
A-106	ST. ALBANS GRAIN CO., St. Albans, Vt. Oats, Hygrade..... Greenfield Farmers Coop. Exch., Greenfield	97.00 94.45 (F.)	* .02	— .69	— 4.84	92 90	3/34 7/34
A-107	Oats, Hygrade..... W. N. Potter Grain Store, Springfield	97.00 95.32 (F.)	* .02	— .67	— 3.99	92 92	3/34 7/34

## FIELD PEAS

A-109	JEROME B. RICE SEED CO., Cambridge, N. Y. Canada Field Peas (2)..... G. E. Doane Hardware, Middleboro	(L. (F.	* 99.93	-.00	-.07	-.00	* 48	/34 7/34
A-110	N. WERTHEIMER & SONS, Buffalo, N. Y. Canada Peas..... Pittsfield Grain Co., Pittsfield	(L. (F.	99.00 99.60	-.00	-.40	-.00	90 92	2/34 7/34
A-111	N. WERTHEIMER & SONS, Ligonier, Ind. Canada Field Peas Lot No. M..... Smith Feed Co., Westfield	(L. (F.	99.00 99.62	-.00	-.38	-.00	90 91	2/34 7/34
A-112	Canada Peas..... Berkshire Hardware Co., Pittsfield	(L. (F.	* 99.84	-.00	-.16	-.00	* 75	* 7/34
RAPE								
A-113	EASTERN STATES FARMERS EX., Springfield Dwarf Essex Rape..... Greenfield Farmers Coop. Ex., Greenfield	(L. (F.	99.55 99.84	Trace .07	.45 .09	-.00	89 94	1/33 6/34
A-114	THOMAS W. EMERSON CO., Boston, Mass. Rape..... Brownell's Hardware Co., Attleboro	(L. (F.	* 99.35	-.19	-.45	-.01	* 87	/34 6/34
A-115	Dwarf Essex Rape..... T. W. Pierce Hardware Co., Middleboro	(L. (F.	* 99.65	-.00	-.26	-.09	* 75	/34 6/34
A-116	Dwarf Essex Rape..... Ryther & Warren, Belchertown	(L. (F.	98.00 99.87	-.00	-.11	-.02	93 94	/33 6/34
A-117	STANFORD SEED CO., Buffalo, N. Y. Dwarf Essex Rape, Lot No. 3576..... R. E. Faulkner, Palmer	(L. (F.	98.00 99.54	.50 .22	-.24	-.00	84.50 72	12/32 6/34
A-118	F. H. WOODRUFF & SONS, Milford, Conn. Dwarf Essex Rape..... Haverhill Hardware & Plumbing Supply Co., Haverhill	(L. (F.	99.00 99.83	* .01	-.16	-.00	98 95	2/34 6/34
RED TOP								
A-119	JOSEPH BRECK & SONS CORP., Boston, Mass. Red Top..... J. William Gove, Inc., Foxboro	(L. (F.	* 91.22	* 1.40	-.574	1.64	* 50	* 6/34

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
RED TOP — Concluded							
A-120	Red Top, Lot No. 39826 Shattuck Stove Co., Inc., Groton	90.00 (L. 89.17 (F.	* 1.90	— 8.43	— .50	90 87	2/32 6/34
A-121	Red Top Swift Bros., Easton	* (L. 91.37 (F.	* .55	— 7.92	— .16	* 87	* 6/34
A-123	ALBERT DICKINSON CO., Chicago, Ill. Red Top, Lot No. 30128 W. N. Fetter Grain Stores, Northampton	95.60 (L. 95.46 (F.	.70 .63	— 3.85	— .06	92 92	1/33 6/34
A-124	THOMAS W. EMERSON CO., Boston Mass. Red Top, Fancy No. 1 Stoughton Hardware Co., Stoughton	98.00 (L. 93.51 (F.	* .49	— 5.41	— .59	93 91	/33 6/34
A-125	Red Top Webster Grain Co., Webster	95.00 (L. 96.19 (F.	.78 .49	— 3.22	— .10	90 96	3/34 6/34
A-126	FARM SERVICE STORES, INC., Boston, Mass. Red Top, Fancy Farm Service Stores, Inc., West Berlin	94.59 (L. 95.95 (F.	.58 .32	— 3.03	— .70	90 93	3/33 7/34
A-127	HOLBROOK MARSHALL, Keene, N. H. Red Top Wright & Fletcher, Westford	95.00 (L. 96.39 (F.	.50 .12	— 3.45	— .04	92 93	3/33 7/34
A-128	SANFORD SEED CO., Greene, N. Y. Red Top T. W. Pierce Hardware Co., Middleboro	* (L. 90.22 (F.	* 2.24	— 7.39	— .15	* 84	/34 7/34
A-122	WILLIAM G. SCARLETT & CO., Baltimore, Md. Red Top J. O. Neill Hardware Co., Fall River	* (L. 94.24 (F.	* .44	— 5.27	— .05	* 90	* 6/34
A-129	STANFORD SEED CO., Buffalo, N. Y. Red Top, Lot No. 3840 Burlingame & Darbys Co., North Adams	92.21 (L. 92.34 (F.	1.76 1.87	— 5.64	— .15	85 80	12/32 6/34
A-130	Red Top, Lot No. 6707 Harding Street Grain Store, Worcester	93.52 (L. 93.49 (F.	.73 .54	— 4.98	— .99	93 95	1/34 6/34

A-132	N. WERTHEIMER & SONS, Ligonier, Ind. Red Top, Matrix, Lot No. 33820. Smith Feed Co., Westfield	94.30 97.08	.28 .13	5.42 2.74	— .05	86 90	8/33 7/34
A-133	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Red Top Knight Grain Co., Newburyport	92.02 93.29	.57 .49	— 5.92	— .30	90 85	10/33 7/34
A-134	Pan-American Red Top Lockhart Hardware Co., Natick	94.01 93.57	1.62 .46	— 5.57	— .40	88 91	2/33 7/34
A-135	Red Top Pierce Hardware Co., Taunton	95.55 92.43	.39 .69	— 6.68	— .20	88 86	/34 6/34R
A-136	Red Top United Coop. Farmers, Inc., Fitchburg	93.11 92.44	.30 .33	— 7.10	— .13	90 89	4/33 7/34
A-137	Red Top, Pan-American A. H. Whidden & Son, Inc., Peabody	95.00 97.49	.57 .77	— 1.64	— .10	90 92	3/34 6/34
A-138	THOMAS W. EMERSON CO., Boston, Mass. Rough Stalked Meadow Grass Frank Howard, Inc., Pittsfield	90.00 93.77	1.50 .94	— 5.19	— .10	90 68	3/34 6/34
A-139	JOSEPH BRECK & SONS CORP., Boston, Mass. Spring Rye, Lot No. 267. Whitcomb-Carter Co., Beverly	98.54 97.86	* .06	— .68	— 1.40	97 85	2/33 7/34 (R)
A-140	EASTERN STATES FARMERS EX., Springfield, Mass. Rosen Rye (2) Greenfield Farmers Coop. Ex., Greenfield	99.15 98.90	.07 .82	.78 .28	.05 .00	90 70	6/33 6/34
A-141	ROSS BROS. CO., Worcester, Mass. Spring Rye Ross Bros. Co., Worcester, Mass.	96.00 97.69	.25 .18	— 1.00	— 1.13	92 90	2/34 7/34
A-142	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Spring Rye Jose J. D'Arruda, Fall River	96.00 98.13	* .27	— .81	— .79	90 88	1/34 7/34

## ROUGH STALKED MEADOW GRASS

## RYE



## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>RYEGRASS</b>							
A-143	THOMAS W. EMERSON CO., Boston, Mass. Pacy's Ryegrass..... Frank Howard, Inc., Pittsfield	99.00 99.50	* .20	— .13	— .17	92 87	3/34 6/34
A-144	English Ryegrass..... Frank Howard, Inc., Pittsfield	99.00 99.06	.10 .65	— .16	— .13	85 81	3/34 6/34
<b>SUNFLOWER</b>							
A-145	THOMAS W. EMERSON CO., Boston, Mass. Mammoth Russian Sunflower..... W. C. Fuller Co., Mansfield	* 99.99	* .00	— .01	— .00	* 84	3/34 7/34
A-146	ESCHELMAN'S LANCASTER, Penn. Sunflower..... S. R. McIntosh, Wilmington	* 98.63	* .00	— 1.37	— .00	* 59	3/34 7/34
A-147	F. H. WOODRUFF & SONS, Milford, Conn. Giant Sunflower..... Peirson Hardware Co., Pittsfield	* 99.54	* .00	— .46	— .00	* 89	* 7/34
<b>TIMOTHY</b>							
A-148	JOSEPH BRECK & SONS CORP., Boston, Mass. Timothy..... J. William Gove, Inc., Foxboro	* 99.65	* .05	— .20	— .10	* 95	* 6/34
A-149	Timothy..... Swift Bros., Easton	* 98.88	* .29	— .29	— .54	* 98	* 7/34
A-150	ALBERT DICKINSON CO., Chicago, Ill. Timothy, Lot No. 68867 (2)..... W. N. Potter Grain Co., Athol	99.50 99.70	.05 .10	— .15	— .05	94 85	8/33 6/34
A-151	Timothy, Lot No. 68891..... Ryther & Warren, Belchertown	99.65 99.65	.05 .05	— .05	— .25	94 90	8/33 6/34
A-152	THOMAS W. EMERSON CO., Boston, Mass. Timothy..... H. B. Blye & Co., Woburn	* 98.43	* .20	— .93	— .44	* 0	3/33 6/34
A-153	Bay State Timothy..... Bradway's News Room, Monson	99.60 99.09	.05 .04	— .17	— .70	94 90	1/34 6/34

A-154	Timothy..... F. W. Carson, Quincy.....	(L. (F.	99.60 98.92	.05 .15	-.34	-.59	94 90	3/34 6/34 (R)
A-155	FARM SERVICE STORES, INC., Waltham, Mass. Timothy..... Farm Service Stores, Inc., Waltham, Mass.	(L. (F.	98.00 97.70	.64 .43	1.53	-.34	90 90	2/33 7/34
A-156	FARM SERVICE STORES, INC., Boston, Mass. Timothy..... Merriam Rolph Grain Co., Fitchburg	(L. (F.	* 99.83	* .00	-.08	-.09	* 86	* 7/34
A-157	ROSS BROS. CO., Worcester, Mass. Timothy, Pine Tree Brand..... C. W. Robinson, Brimfield	(L. (F.	99.60 99.81	.05 .09	-.05	-.05	94 90	12/32 6/34
A-158	SANFORD SEED CO., Greene, N. Y. Timothy..... T. W. Pierce Hardware Co., Middleboro	(L. (F.	* 99.55	* .05	-.35	-.05	* 76	*/34 6/34
A-159	WM. G. SCARLETT & CO., Baltimore, Md. Timothy..... Bartlett & Dow Co., Lowell	(L. (F.	99.65 99.75	.10 .05	-.15	-.10 .05	90 86	4/33 6/34
A-160	STANFORD SEED CO., Buffalo, N. Y. Timothy, Lot No. 6465..... Carr Hardware Co., Pittsfield	(L. (F.	99.60 99.26	.10 .20	-.34	-.20	92 86	5/33 6/34
A-161	Timothy, Lot No. 5117..... Harding Street Grain Store, Worcester	(L. (F.	99.70 99.75	.05 .05	-.15	-.05	93 90	3/34 6/34
A-162	N. WERTHEIMER & SONS, Buffalo, N. Y. Timothy, Lot No. 33534..... W. N. Potter Grain Stores, Northampton	(L. (F.	99.65 99.65	.23 .05	.05 .20	.06 .10	92 88	3/34 6/34
A-163	N. WERTHEIMER & SONS, Ligonier, Ind. Timothy, Lot No. 33534..... W. N. Potter Grain Stores, Inc. Orange	(L. (F.	99.65 99.61	.06 .15	.23 .19	-.05	92 88	3/34 6/34
A-164	Timothy, Lot No. 33533..... Smith Feed Co., Westfield	(L. (F.	99.57 99.58	.20 .05	-.18	-.19	92 90	1/34 7/34
A-165	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan-American Timothy..... Fiske Corporation, Natick	(L. (F.	99.60 99.65	.05 .10	-.15	-.10	90 94	1/34 6/34
A-166	Frontier Timothy..... Millbury Grain Co., Millbury	(L. (F.	98.00 97.80	.40 .63	1.19	-.38	90 90	2/33 7/34
A-167	Timothy..... Harry Seder, Webster	(L. (F.	99.60 99.76	.05 .05	-.09	-.10	90-1 88	1/33 6/34

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
TIMOTHY — Concluded							
A-168	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. — Concluded Pan-American Timothy.....	99.60 (F.)	.12 .05	— .20	— .15	90 91	3/34 6/34
A-169	Timothy..... Thompson Hardware Co., Lowell	* (F.)	* .05	— .15	— .05	* 91	1/34 6/34
A-170	S. D. WOODRUFF & SONS, Orange, Conn. Timothy, Lot No. 380..... Danvers Hardware Co., Danvers	99.60 (F.)	.08 .05	— .14	— .00	90 89	3/34 6/34
MIXTURES							
A-10	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Creeping Bent Grass..... Red Top..... Creeping Bent } Approx. 50 % each of pure seed. Foster-Farrar Co., Northampton	80.00 (L.)	1.12 .80	— 5.59	— .00	80 69	2/34 6/34
A-22	N. WERTHEIMER & SONS, Ligonier, Ind. Alsike Clover, Lot No. 33107..... The Cutler Co., No. Wilbraham Alsike Clover..... White Clover.....	92.11 (F.) 99.47 (F.) 92.41 (F.) 7.06	.39 .23	.15 .04	— .26	81.9 74.5-20.5 58.5-40.5	1/34 5/34
A-23	N. WERTHEIMER & SONS, Buffalo, N. Y. Alsike, Lot No. 33107..... W. N. Potter Grain Stores, Springfield Alsike Clover..... White Clover.....	92.11 (F.) 99.26 (F.) 90.34 (F.) 8.92	1.35 .35	— .08	— .31	81.9 73-24 58.5-40.5	1/34 5/34
A-62	White Clover..... The Ware Grain & Coal Co., Ware White Clover..... White Clover..... Alsike Clover.....	98.00 (L.) 97.45 (F.) 89.63 (F.) 7.82	* 1.69	— .77	1.50 .09	93 72-11 58-2	2/27 6/34
A-85	F. H. WOODRUFF & SONS, Milford, Conn. Mammoth Long Red Mangel..... T. W. Pierce Hardware Co., Middleboro Mangel..... Rape.....	* (L.) 98.51 (F.) 73.48 (F.) 25.03	* .00	— 1.38	— .11	* 81 72	/34 7/34

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES					
C- 1	APOTHECARIES HALL COMPANY, Waterbury, Conn.				
	A. H. Co., Special Lawn Grass Mix.....	—	1.00	6.00	—
	Ryegrass, (6), Kentucky bluegrass, Fancy red top Fescues (6), White Clover, and other grasses (6)	.....(L.)			
	Maskell Broderick Co., Lenox.....				
	Red Top.....	.....(F.)	.67	3.71	.10
	Domestic Ryegrass.....	.....32.03			
	Kentucky Bluegrass.....	.....29.18			
	Chewings Fescue.....	.....15.30			
	Meadow Fescue.....	.....6.65			
	White Clover.....	.....6.56			
C- 2	ATLANTIC GRASS SEED CO., New York, N. Y.				
	Universal Lawn Seed Grass.....	.....(L.)	1.00	16.00	—
	Domestic Ryegrass, Red Top, Kentucky Bluegrass.....				
	And. F. Curtin & Sons, Medford.....	.....(F.)	1.14	14.13	.15
	Domestic Ryegrass.....	.....42.79			
	Red Top.....	.....24.09			
	Kentucky Bluegrass.....	.....9.19			
	Chewings Fescue (3).....	.....8.51			
	Wonderlawn Grass.....	.....(L.)	1.00	18.00	—
	N. Z. Fescue, Red Top, Domestic Ryegrass, Kentucky Bluegrass.....				
C- 3	And. F. Curtin & Sons, Medford.....	.....(F.)	.60	15.26	.20
	Domestic Ryegrass.....	.....35.08			
	Red Top (hulled & unhulled).....	.....30.53			
	Kentucky Bluegrass.....	.....10.80			
	New Zealand Fescue.....	.....7.53			
	Wonderland Shady Grass Seed.....	.....(L.)	1.00	14.00	—
	Red Top, Kentucky Bluegrass, Poa trivialis, Domestic Ryegrass, New Zealand Fescue.....				
	Haverhill Hardware & Plumbing Supply Co., Haverhill.....	.....(F.)	.28	11.15	.19
	Rough Stalked Meadow Grass.....	.....24.09			
	Domestic Ryegrass.....	.....23.24			
C- 4	Red Top.....	.....17.15			
	New Zealand Fescue.....	.....15.28			
	Kentucky Bluegrass.....	.....8.62			

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES — Continued					
C- 5	ATLANTIC GRASS SEED CO., New York, N. Y. — Concluded				
	Premium Green Lawn Mixture.....	(L.)	1.75	28.00	-
	Domestic Ryegrass, Red Top, Timothy, 1% White Clover, 1% Kentucky Bluegrass				
	Waltham Supply Co., Inc., Waltham.....	(F.)	3.30	24.30	2.40
	Timothy.....	40.70			
	Domestic Ryegrass.....	14.00			
	Red Top.....	10.80			
	Kentucky Bluegrass.....	2.80			
	White Clover.....	1.70			
	JOSEPH BRECK & SONS CORP., Boston, Mass.				
C- 6	Good Trade Lawn Mixture, Lot No. 38259.....	(L.)	.78	3.34	-
	(Ingredients Not Named)*				
	Bent's Hardware, Brighton.....	(F.)	.35	3.40	.96
	Domestic Ryegrass.....	47.61			
	Timothy.....	32.01			
	Red Top (Unhulled).....	7.40			
	Crested Dog's Tail.....	3.13			
	White Clover.....	3.48			
	Kentucky Bluegrass.....	.96			
	Canada Bluegrass.....	.35			
C- 7	Rough Stalked Meadow Grass.....	.35			
	Boston Park Grass.....	(L.)	1.50	10.00	-
	Kentucky Bluegrass, Recleaned Red Top, Perennial Ryegrass, Meadow Fescue, White Clover				
	Central Hardware Co., Winchester.....	(F.)	.49	5.72	.69
	Red Top.....	38.66			
	Kentucky Bluegrass.....	37.18			
	Perennial Ryegrass.....	9.17			
	Meadow Fescue.....	7.00			
	White Clover (5).....	1.09			
	Shady Spot Lawn Grass Mixture, Lot No. 1327.....	(L.)	.68	18.00	-
C- 8	Red Top, Kentucky Bluegrass, Rough Stalked Meadow Grass, Fine Leaf Fescue				
	Frank W. Richardson, Waltham.....	(F.)	.75	16.32	1.98
	Rough Stalked Meadow Grass.....	33.96			
	Red Top.....	32.93			
	Kentucky Bluegrass.....	12.64			
	Fine Leaved Fescues (Festuca Spp.) (5).....	1.42			

C-9	Breck's Setab Lawn Mixture.....	(L.)	92.00	.70	7.30	-
	(Ingredients Not Named)*					
	Henry L. Sawyer, Newton Highlands.....	(F.)	92.65	.48	6.83	.04
	Red Top.....					
	Timothy.....					
C-10	Kentucky Bluegrass.....					
	White Clover.....					
	Breck's Special Mix.....	(L.)	92.00	.70	7.30	-
	Clean Red Top, Timothy, Kentucky Bluegrass, White Clover					
	United Coop. Farmers, Inc., Fitchburg.....	(F.)	93.79	.49	5.62	.10
C-11	Red Top.....					
	Timothy.....					
	White Clover.....					
	Kentucky Bluegrass (5).....					
	COMSTOCK, FERRE CO., Wethersfield, Conn. Special Mix.....	(L.)	-	.42	8.00	-
C-12	Excess of 5% of Red Top, Kentucky Bluegrass, Chewings Fescue, Ryegrass (6) Lot No. 3001					
	Foster-Farrar Co., Northampton.....	(F.)	89.39	.34	8.85	1.42
	Agrostis spp. (Red Top & Colonial Bent).					
	Kentucky Bluegrass.....					
	Domestic Ryegrass.....					
C-13	Chewings Fescue.....	(L.)	-	.32	10.00	-
	Special Mixture.....					
	Red Top, Kentucky Bluegrass, Ryegrass, (6) Red Fescue, Rough Stalked Meadow Grass, "Shady Spot"					
	Excess of 5% of Ingredients					
	Foster-Farrar Co., Northampton.....	(F.)	87.55	.55	10.07	1.83
C-13	Agrostis spp. (Red Top & Colonial Bent)					
	Domestic Ryegrass.....					
	Red Fescue.....					
	Rough Stalked Meadow Grass.....					
	Kentucky Bluegrass.....					
C-13	DURYEA SEED CO., New York City Green Park Lawn Seed.....	(L.)	-	1.50	18.00	-
	Red Top 24.27, Kentucky Bluegrass 8.60, Domestic Ryegrass 30.02, Timothy 17.11, White Clover 1.00					
	F. W. Woolworth Co., North Adams.....	(F.)	86.47	.39	12.84	.30
	Domestic Ryegrass.....					
	Red Top.....					
C-13	Timothy.....					
	Kentucky Bluegrass.....					
	White Clover.....					
	White Clover.....					
	White Clover.....					

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES — Continued					
C-14	THOMAS W. EMERSON CO., Boston, Mass.				
	Gem Lawn Seed.....	-	*	8.5	-
	Chewings Red Fescue, Red Top, Kentucky Bluegrass, Timothy (5), German Bent, (4) White Clover	(L.)			
	J. J. Hanley Hardware Co., Marlboro.				
	Red Top & Colonial Bent.....	(F.)	.19	9.12	.10
	Kentucky Bluegrass.....	55.78			
	Chewings Fescue.....	21.18			
	White Clover.....	7.55			
		6.08			
C-15	Emerson's Special Mixed Lawn Seed.....	(L.)	.5	4.3	-
	Red Top, Kentucky Bluegrass, Chewings Red Fescue, White Clover, German Bent (4)				
	W. R. Hill Hardware, Andover.				
	Agrostis spp. (Red Top & Colonial Bent)	(F.)	.50	4.78	.10
	Kentucky Bluegrass.....	64.24			
	Chewings Fescue.....	13.84			
	White Clover.....	8.57			
		7.97			
C-16	Special Lawn Seed Mix.....	(L.)	.5	4.3	-
	Red Top, Kentucky Bluegrass, White Clover, Chewings Fescue Red, German Bent (4)				
	Arthur C. Lamson, Inc., Marlboro.				
	Red Top & Colonial Bent.....	(F.)	.49	4.88	.10
	Kentucky Bluegrass.....	60.16			
	Chewings Fescue.....	14.06			
	White Clover.....	12.69			
		7.62			
C-17	Early Green Lawn Seed Grass.....	(L.)	1.00	8.00	-
	Red Top, Kentucky Bluegrass, Timothy, Domestic Ryegrass, White Clover				
	O'Brien Hardware Co., East Milton.				
	Domestic Ryegrass.....	(F.)	.54	4.79	.18
	Timothy.....	30.59			
	Red Top.....	28.68			
	Kentucky Bluegrass.....	26.52			
	White Clover (5).....	6.80			
		1.90			

C-18		(L.	.5	8 0
C-18	Early Green Special Mixture White Clover, Red Top, Timothy, Kentucky Bluegrass, Domestic Ryegrass, Canada Bluegrass (4)	(F.	.29	7 08
	W. N. Potter Grain Stores, Inc., Northampton			
	Red Top.....	29.31		
	Kentucky Bluegrass.....	27.28		
	Timothy.....	21.45		
	Domestic Ryegrass.....	9.80		
	White Clover.....	4.75		
	Emerson's Gem Lawn Seed.....	(L.	.40	8.50
	Chewings Fescue, Red Top, Kentucky Bluegrass, Timothy, German Bent, (4), White Clover			
C-19	John F. Robinson & Co., Ware	(F.	.90	6.49
	Red Top.....	29.17		
	Timothy.....	19.18		
	Kentucky Bluegrass.....	15.69		
	Rough Stalked Meadow Grass (3).....	12.49		
	Perennial Ryegrass (3).....	5.20		
	White Clover.....	4.60		
	New Zealand Fescue.....	3.20		
	Meadow Fescue (3).....	2.88		
C-20	FREDONIA SEED CO., Fredonia, N. Y.	(L.	.40	31.40
	Velvet Lawn Grass.....			
	Red Top, Domestic Ryegrass, Timothy, Kentucky Bluegrass, White Clover			
	M. F. Packard, Worthington	(F.	.30	31.51
	Red Top.....	25.53		
	Domestic Ryegrass.....	17.53		
	Timothy.....	13.23		
	White Clover.....	6.71		
	Kentucky Bluegrass.....	5.15		
C-21	GARFIELD, WILLIAMSON CO., New York City	(L.	1.00	18.00
	Harvard Lawn Seed Grass.....			
	Kentucky Bluegrass, Domestic Ryegrass, Timothy, Red Top			
	Sam's Auto Supply Co., Norwood	(F.	.90	14.00
	Domestic Ryegrass.....	44.60		
	Timothy.....	21.40		
	Red Top.....	10.50		
	Kentucky Bluegrass.....	8.00		
				.60



## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES — Continued					
C-22	CHARLES C. HART SEED CO., Wethersfield, Conn.				
	Special Mix.....	78.43	.87	20.70	-
	Fancy Red Top, Timothy, Kentucky Bluegrass, Domestic Ryegrass, Chewings Fescue (All in excess of 5%), White Clover 2%, Lot No. 1.	(L.			
	Federal Supply Co., Northampton.....	(F.	.77	15.21	.19
	Red Top.....	31.72			
	Domestic Ryegrass.....	17.43			
	Timothy.....	16.38			
	Kentucky Bluegrass.....	8.39			
	Chewings Fescue.....	7.72			
	White Clover.....	2.19			
C-23	PEDIGREED SEED CO., INC., New York City				
	Woodlawn Shady Grass.....	(L.	1.00	15.00	-
	Kentucky Bluegrass, Red Top, Meadow Fescue, Red Fescue, Rough Stalked Meadow Grass, (Poa Trivialis), White Clover 2%.				
	Arthur E. Wills, Medfield.....	(F.	.80	8.49	.70
	Red Top.....	38.56			
	Kentucky Bluegrass.....	17.08			
	Rough Stalked Meadow Grass.....	12.59			
	Meadow Fescue.....	11.89			
	Fine Leaved Fescue.....	8.09			
	White Clover.....	2.30			
C-24	I. L. RADWANER SEED CO., INC., New York City				
	Radway's Mixed Lawn Grass, Central Park.....	(L.	1.00	19.00	-
	Domestic Ryegrass, Timothy, Fancy Red Top, Kentucky Bluegrass 1%, White Clover 1%, (Red Top 8%)				
	Hutchinson Hardware Co., Lynn.....	(F.	2.28	24.06	.59
	Domestic Ryegrass.....	(R.	1.88	24.41	.64
	Timothy.....	43.38			
	Red Top.....	23.36			
	Kentucky Bluegrass.....	4.35			
	White Clover.....	.60			
	White Clover.....	1.88			

C-25	Central Park Choice Grass.....		80.00	1.00	19.00	-
	Red Top, Domestic Ryegrass, Timothy, 4% Poa Trivialis, 4% Kentucky Bluegrass, 4% White Clover.....					
	Norwood Hardware Supply Co., Norwood Timothy.....			1.35	15.47	.96
	Domestic Ryegrass.....					
	Red Top.....					
	Kentucky Bluegrass.....					
	Rough Stalked Meadow Grass.....					
	White Clover.....					
C-26	RICE SEED CO., Cambridge, N. Y. Rice's Lawn Grass.....			.83	14.82	-
	Red Top 27.25%, Domestic Ryegrass 12.70%, Red Fescue 10.15%, Kentucky Bluegrass 30.75%, White Clover 3.50%.....					
	Central Square Hardware Co., Cambridge. Kentucky Bluegrass.....			.35	9.95	.55
	Red Top.....					
	Domestic Ryegrass.....					
	White Clover (5).....					
	Red Fescue (5).....					
C-27	SEARS, ROEBUCK & CO., Chicago, Ill. Shady Spot Grass.....			1.00	7.95	-
	26.74% Kentucky Bluegrass, 19.25% Red Top, 9.86% Meadow Fescue, 9.72% Chewings Fescue, 25.48% Poa Trivialis.....					
	Sears, Roebuck & Co., Quincy. Kentucky Bluegrass.....			.20	15.93	.60
	Meadow Fescue.....					
	Red Top.....					
	Chewings Fescue.....					
	Rough Stalked Meadow Grass (5).....					
C-28	Green Karpet Grass.....			1.38	13.56	-
	12.02% Kentucky Bluegrass, 28.05% Red Top, 29.16% Meadow Fescue, 15.83% Timothy Sears, Roebuck & Co., Quincy.....			.70	16.34	.49
	Meadow Fescue.....					
	Red Top.....					
	Timothy.....					
	Kentucky Bluegrass.....					

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES — Continued					
STANFORD SEED CO., Buffalo, N. Y.					
C-29	Special Mixture.....	-	1.00	18.00	-
	Kentucky Bluegrass, Fancy Red Top, Timothy, White Clover, Domestic Ryegrass	(L.			
	Waite Hardware Co., Worcester.....	(F.	1.08	17.51	.09
	Red Top.....	21.64			
	Timothy.....	21.24			
	Kentucky Bluegrass.....	21.15			
	Domestic Ryegrass.....	10.97			
	White Clover.....	6.32			
N. WERTHEIMER AND SONS, Ligonier, Ind.					
C-30	Lawn Grass Mixture.....	(L.	.34	10.80	.08
	Bluegrass 85, Red Top 93, White Clover 96, Poa Trivialis 90, Red Fescue 90, White Dutch 90				
	The Cutler Co., No. Wilbraham.....	(F.	76.52	22.21	.09
	Red Top.....	29.22			
	Kentucky Bluegrass.....	14.41			
	Red Fescue.....	8.78			
	Canada Bluegrass.....	8.58			
	Timothy.....	6.36			
	Rough Stalked Meadow Grass.....	4.63			
	White Clover.....	4.54			
N. WERTHEIMER & SONS, Buffalo, N. Y.					
C-31	Lawn Grass Mixture.....	(L.	34	10.03	.08
	Blue grass 80%, Poa Trivialis 90%, Red Top 93%, Red Fescue 90%, White Dutch 90%				
	The Ware Grain & Coal Co., Ware.....	(F.	77.03	21.83	.05
	Red Top.....	30.36			
	Kentucky Bluegrass.....	15.02			
	Red Fescue.....	6.25			
	Canada Bluegrass (3).....	9.18			
	White Clover.....	5.80			
	Timothy (3).....	5.65			
	Rough Stalked Meadow Grass.....	4.77			

	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.				
C-32	Boston Special Lawn Seed.....	(L.	84.00	1.00	12.50
	Fancy Red Top, Kentucky Bluegrass, Fancy White Clover, Timothy	(F.	87.22	.69	11.79
	Russell R. Cameron, Cambridge				
	Red Top.....				60.46
	Timothy.....				13.98
	Kentucky Bluegrass.....				6.74
	White Clover.....				6.04
C-33	Sylvan Shady Spot.....	(L.	-	.80	10.00
	Kentucky Bluegrass, Canada Bluegrass, Fancy Red Top, Domestic Ryegrass, Timothy, Rough Stalked Meadow, Crested Dogstail, Bent Grass, (6) New Zealand Chewings Fescue	(F.	88.79	1.50	9.50
	Highland Mills Co., Inc., Newton.....				21.83
	Agrostis spp. (Red Top and Creeping Bent)				11.80
	Kentucky Bluegrass.....				20.80
	Wood Meadow Grass (3).....				10.20
	Domestic Ryegrass.....				7.10
	Chewings Fescue.....				5.22
	Timothy.....				4.30
	Canada Bluegrass.....				7.04
	Crested Dogstail.....				.50
	Rough Stalked Meadow Grass (5).....				
C-34	Excelsior Lawn Seed.....	(L.	-	.70	10.00
	Red Top, Kentucky Bluegrass, White Clover, Chewings Fescue	(F.	89.68	.60	9.52
	Highland Mills Co., Inc., Newton.....				50.59
	Red Top.....				26.59
	Kentucky Bluegrass.....				7.84
	White Clover.....				4.66
	Chewings Fescue.....				
C-35	Special Excelsior Lawn Seed Mixture Lot No. 1256.....	(L.	-	.70	10.00
	Kentucky Bluegrass, Fancy Red Top, New Zealand Chewings Fescue, White Clover	(F.	89.25	.80	9.90
	Hutchinson Hardware Co., Lynn.....				49.25
	Red Top.....				26.90
	Kentucky Bluegrass.....				7.60
	White Clover.....				5.50
	Chewings Fescue.....				

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES — Concluded					
C-36	Special Lawn Mixture.....	-	1.25	10.00	2.25
	Kentucky Bluegrass 42%, Fancy Red Top 30%, Domestic Ryegrass 14%, White Clover 2%	(L.)			
	S. S. Kresge Co., Northampton.....	(F.)	.20	11.71	1.92
	Kentucky Bluegrass.....	40.20			
	Red Top.....	30.21			
	Domestic Ryegrass.....	13.64			
C-37	White Clover.....	2.12			
	City Park Special Mixture.....	(L.)	1.5	16.00	2.5
	Red Top, Canada Bluegrass (4), Timothy, Domestic Ryegrass (4), White Clover				
	J. B. Sibley & Son, Ware.....	(F.)	.89	8.90	.05
	Red Top.....	63.17			
	Timothy.....	13.88			
C-38	White Clover.....	7.49			
	Kentucky Bluegrass (3).....	5.62			
	Eureka Best Grass.....	(L.)	.6	8.0	2.0
	Kentucky Bluegrass, Fancy Red Top, White Clover, Chewings Fescue, Bent Grass (4)				
	Sinclair Hardware Co., Medford.....	(F.)	1.28	11.17	3.27
	Red Top.....	49.46	1.17	10.94	3.40
C-39	Kentucky Bluegrass.....	20.58			
	White Clover.....	5.44			
	Chewings Fescue.....	5.24			
	Domestic Ryegrass (3).....	3.56			
	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Special Shady Spot Lawn Seed.....	(L.)	1.00	13.00	2.00
	Red Top, Domestic Ryegrass, Canada Bluegrass, Kentucky Bluegrass, Fescue spp. (6), Crested Dogtail, Timothy				
C-39	Whitcomb-Carter Co., Beverly.....	(F.)	1.10	17.80	.70
	Timothy.....	21.40			
	Domestic Ryegrass.....	14.80			
	Red Top.....	13.70			
	Kentucky Bluegrass.....	8.50			
	Canada Bluegrass.....	7.50			
C-39	Rough Stalked Meadow Grass (3).....	5.20			
	Crested Dogtail.....	4.90			
	Meadow Fescue.....	4.40			

## F. H. WOODRUFF &amp; SONS, Milford, Conn.

C-40	Lawn Seed Grass Mixture.....	(L.	-	1.00	16.00	-
	Kentucky Bluegrass, Milford Green.....					
	Red Top, White Clover, Domestic Ryegrass, Lot No. 4-2.....					
	Oscar T. Gove, Amesbury.....	(F.	87.17	.59	11.26	.98
	Red Top.....					
	Kentucky Bluegrass.....		38.26			
	Domestic Ryegrass.....		17.92			
	Chewings Fescue.....		16.09			
	White Clover.....		8.98			
			5.92			

## UNKNOWN

C-41	Green Karpet Grass Seed.....	(L.	-	1.38	13.56	-
	Kentucky Bluegrass 12.02%, Red Top 28.05%, Meadow Fescue 29.16%, Timothy 15.83%.....					
	Sears, Roebuck & Co., Fitchburg.....	(F.	75.41	2.55	21.99	.05
	Meadow Fescue.....			2.58	20.41	
	Red Top.....					
	Timothy.....		27.83			
		R.	21.26			
			13.87			
	Kentucky Bluegrass.....		12.95			

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
BEANS			
D- 1	JOSEPH BRECK & SONS CORP., Boston, Mass. Golden Wax Dwarf Beans..... Frank W. Richardson, Waltham	90	Aug.
D- 2	Fordhook Bush Lima Beans..... J. E. Jordan Hardware Co., Plymouth	77	Aug.
D- 3	Breck's Dwarf Horticultural Beans..... Henry L. Sawyer Co., Newton Highlands	91	Aug.
D- 4	Black Wax Pencil Pod Beans..... C. B. Coburn & Co., Lowell	90	Aug.
D- 5	Long Yellow Six Weeks Beans..... F. W. Carson, Quincy	90	Aug.
D- 6	Golden Wax Beans..... Winer's, Inc., Quincy	88 (R)	Aug.
D- 7	Dwarf Horticultural Beans..... Farm Service Stores, Inc., West Berlin	80	Aug.
D- 8	Early Refugee Beans..... Brockton Hardware Supply Co., Brockton	80 (R)	Aug.
D-395	Kentucky Wonder Green Beans..... E. E. Bickford & Co., Hingham	90	Aug.
D- 9	COMSTOCK, FERRE & CO., Wethersfield, Conn. Bountiful Beans..... J. O. Neill Hardware Co., Fall River	92	Aug.
D- 10	Tender Green Beans..... Carlisle Hardware Co., Springfield	94 (R)	Aug.
D-386	CROSSMAN SEED CO., East Rochester, N Y. Early Red Valentine Beans..... S. S. Kresge Co., Northampton	92	Aug.
D-387	Pencil Pod Black Wax Beans..... S. S. Kresge Co., Northampton	97	Aug.
D- 11	THOMAS W. EMERSON CO., Boston, Mass. Six Weeks Beans..... Plymouth Rock Hardware Co., Plymouth	98 (R)	Aug.
D- 12	Golden Wax Beans..... Plymouth Rock Hardware Co., Plymouth	90 (R)	Aug.
D- 13	Yellow Six Weeks Stringless Bush Beans..... Hutchinson Hardware Co., Lynn	94	Aug.
D- 14	Golden Wax Beans..... Gruener Hardware Store, Fitchburg	89 (R)	Aug.
D- 15	Yellow Eye Beans..... Gruener Hardware Store, Fitchburg	96 (R)	Aug.
D- 16	Red Kidney Beans..... Orange Hardware Co., Orange	96 (R)	Aug.
D- 17	Red Kidney Beans..... Brownell's Hardware Co., Attleboro	94 (R)	Aug.
D- 18	Imp. Yellow Eye Wax Beans..... W. C. Fuller Co., Mansfield	93 (R)	Aug.
D- 19	Black Valentine Beans..... W. G. Pearce Co., Fall River	79 (R)	Aug.
D- 20	Davis White Wax Beans..... Brownell's Hardware Co., Attleboro	90 (R)	Aug.
D- 21	Kentucky Wonder Pole Beans..... Howe Bros., Abington	89 (R)	Aug.

Note. — (R) indicates a retest.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
BEANS — Continued			
THOMAS W. EMERSON CO., Boston, Mass. — Continued			
D- 22	Round Pod Kidney Wax Beans..... W. R. Hill Hardware, Andover	91 (R)	Aug.
D- 23	Long Yellow Six Weeks Beans..... The O. B. Parks Co., Westfield	90 (R)	Aug.
D-394	White Marrow Beans..... O. B. Parks Co., Westfield	96	Aug.
D-393	Black Wax Beans..... H. A. Spear & Son, Walpole	90	Aug.
R. FAULKNER, Palmer, Mass.			
D- 24	Wax Dwarf Beans..... L. H. Thompson, Wales	95 (R)	Aug.
FREDONIA SEED CO., Fredonia, N. Y.			
D-388	Early Red Valentine Bush Beans..... A. H. Phillips, Belchertown	78	Aug.
CHARLES C. HART SEED CO., Wethersfield, Conn.			
D- 25	White Navy Pea Beans..... Peirce Hardware Co., Taunton	94 (R)	Aug.
D- 26	Green Pod Early Red Beans..... Waltham Hardware Co., Inc., Waltham	97	Aug.
D- 27	Brittle Wax Beans..... Waite Hardware Co., Webster	94 (R)	Aug.
D- 28	Dwarf Horticultural or Cranberry Beans..... Federal Supply Co., Northampton	95	Aug.
D- 29	Kentucky Wonder Green Beans..... Waite Hardware Co., Worcester	92 (R)	Aug.
LEONARD SEED CO., Chicago, Ill.			
D- 30	Burpee's Imp. Stringless Kidney Wax Beans..... A. E. Stewart Estate, Athol	12	Aug.
NORTHROP, KING CO., Minneapolis, Minn.			
D- 31	Green Pod Bush Bountiful Beans..... Robert Allison, East Pepperell	97	Aug.
D- 32	Impr. Golden Wax Yellow Pod Bush Beans..... Robert Allison, East Pepperell	90	Aug.
OLDS & WHIPPLE, Hartford, Conn.			
D- 33	Cranberry Pole Beans..... Stoughton Hardware Co., Stoughton	94	Aug.
PAGE SEED CO., Greene, N. Y.			
D- 34	Black Wax Beans..... Henry L. Sawyer, Framingham	95 (R)	Aug.
D- 35	Worcester Pole — Brockton Shell Beans..... J. H. Fairbanks & Co., Bridgewater	56	Aug.
D- 36	Imp. Goddard Beans..... J. H. Fairbanks & Co., Bridgewater	97	Aug.
D- 37	Dwarf Horticultural Beans..... H. S. Packard, Cummington	95	Aug.
D- 38	Long Yellow Six Weeks Beans..... Cassidy Bros., Sheffield	90	Aug.
D- 39	Golden Wax Dwarf Beans..... The Clifford Co., Lenox	68 (R)	Aug.
D- 40	Kentucky Wonder Beans..... F. J. Noel, Lancaster	94	Aug.
D-396	Pencil Pod Black Wax Beans..... C. R. Ripley, Blandford	95	Aug.



## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
BEANS — Concluded			
D- 41	PERRY SEED CO., Boston, Mass. Kentucky Wonder Beans, Lot No. 943..... G. F. Bunker, Brighton	97	Aug.
D- 42	JEROME B. RICE SEED CO., Cambridge, N. Y. Wardwell's Kidney Wax Beans..... G. E. Doane Hardware, Middleboro	83 (R)	Aug.
D- 43	Black Wax Pencil Beans..... R. A. Stacey & Son, Williamstown	92	Aug.
D- 44	Red Kidney Beans..... Danaher Hardware Co., Williamstown	85 (R)	Aug.
D- 45	Long Yellow Six Weeks Beans..... Sinclair Hardware Co., Medford	95	Aug.
D- 46	Dreer's Lima Bush Beans..... Sinclair Hardware Co., Medford	78	Aug.
D-389	Black Butter, or German Dwarf Wax Beans..... O. B. Parks Co., Westfield	70	Aug.
D-390	Dwarf Rust Proof Golden Wax Beans..... T. F. Ayers, Shrewsbury	90	Aug.
D-391	Burpee's Stringless Green Pod Beans..... Harry E. Bingham, Hardwick	95	Aug.
D-397	Scarlet Runner Beans..... Pierce Hardware Co., Taunton	94	Aug.
D-392	STERLING SEED CO., Minneapolis, Minn. Early Stringless Dwarf Beans..... H. L. Green, Webster	77	Aug.
D- 47	F. H. WOODRUFF & SONS, Milford, Conn. Long Yellow Six Weeks Beans..... Oscar T. Gove, Amesbury	92	Aug.
D- 48	Pencil Pod Black Wax Beans..... Greenfield Farmers Cooperative Exchange, Greenfield	96	Aug.
D- 49	Bountiful Beans..... Crown Paint & Paper, Inc., North Adams	88 (R)	Aug.
D- 50	Refugee Beans..... Crown Paint & Paper, Inc., North Adams	87 (R)	Aug.
D- 51	Burpee's Imp. Dwarf Bush Lima Beans..... W. C. Ring, Palmer	83	Aug.
D- 52	Dwarf Horticultural Beans..... J. B. Sibley & Son, Ware	88 (R)	Aug.
D- 53	Burpee's Stringless Green Pod Beans..... S. Allen's Sons, Greenfield	95	Aug.
D- 54	Tendergreen Beans..... Martin W. Dugan Co., Newburyport	89 (R)	Aug.
D-398	French Horticultural Dwarf Beans..... Thompson Hardware, Lowell	86	Aug.
D- 55	S. D. WOODRUFF & SONS, Orange, Conn. Burpee's Stringless Beans..... Danvers Hardware Co., Danvers	76	Aug.
D- 56	ZWAAN & VAN DER MOLLEN, INC., Voorburg-The Hague Hangdown Long Pod-Extra Selected Favas Beans..... Jose J. D'Arruda, Fall River	93	Aug.
BEETS			
D- 57	JOSEPH BRECK & SONS CORP., Boston, Mass. Detroit Dark Red Beets..... J. E. Jordan Hardware Co., Plymouth	95	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
BEETS — Continued			
D- 58	Edmunds Beets. . . . . Whitcomb-Carter Co., Beverly	90	Aug.
D-399	Dewings Early Blood Beets. . . . . Farms Service Stores, West Berlin	69	Aug.
D- 59	THOMAS W. EMERSON CO., Boston, Mass. Detroit Dark Red Beets. . . . . W. R. Hill Hardware, Andover	83	Aug.
D-400	Crosby's Egyptian Beets. . . . . P. R. Winters, Belmont	78	Aug.
D-401	Edmond's Imported Blood Turnip Beets. . . . . P. R. Winters, Belmont	82	Aug.
D- 60	FERRY SEED CO., Detroit & San Francisco Crosby's Egyptian Beets. . . . . Russell R. Cameron, Cambridge	82	Aug.
D-402	FREDONIA SEED CO., Fredonia, N. Y. Early Eclipse Beets. . . . . Clover Farm Stores, Grafton	73	Aug.
D-403	Early Blood Turnip Beets. . . . . Mongeon & Lynch, Auburn	72	Aug.
D-404	CHARLES C. HART SEED CO., Wethersfield, Conn. Early Wonder Beets. . . . . Waite Hardware Co., Worcester	78	Aug.
D- 61	LAKE SHORE SEED CO., Dunkirk, N. Y. Detroit Dark Red Beets. . . . . C. A. Gifford Estate, Westport	84	Aug.
D- 62	LEONARD SEED CO., Chicago, Ill. Detroit Dark Red Beets. . . . . A. E. Stewart Estate, Athol	81	Aug.
D- 63	NORTHROP, KING & CO., Minneapolis, Minn. Early Wonder Beets. . . . . A. L. Avery & Son, Charlemont	84	Aug.
D- 64	Extra Early Egyptian Beets. . . . . Russell R. Cameron, Cambridge	94	Aug.
D-405	Extra Early Egyptian Beets. . . . . O. B. Parks, Westfield	76	Aug.
D- 65	PAGE SEED CO., Greene, N. Y. Crosby's Egyptian Beets. . . . . A. C. Stone Hardware Co., Brockton	76	Aug.
D-406	Page's Early Wonder Beets. . . . . Harry E. Bingham, Hardwick	46	Aug.
D- 66	JEROME B. RICE SEED CO., Cambridge, N. Y. Eclipse Blood Turnip Beets. . . . . Central Square Hardware Co., Cambridge	86	Aug.
D- 67	Crosby's Dark Red Egyptian Turnip Beets. . . . . S. C. French, Royalston	88	Aug.
D- 68	Eclipse Blood Turnip Beets. . . . . W. A. & R. E. Thompson, Colrain	71	Aug.
D- 69	Egyptian Beets. . . . . Payne-Cummington Hardware, North Adams	85	Aug.
D-407	Egyptian Beets. . . . . Payne-Cummings Hardware Co., North Adams	77	Aug.
D-408	Eclipse Beets. . . . . Burlingame & Darbys Co., North Adams	73	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
BEETS — Concluded			
D- 70	ROSS BROS. CO., Worcester, Mass. Crosby's Early Egyptian Beets..... Leicester Paint & Hardware Co., Leicester	71	Aug.
D- 71	Early Eclipse Beets..... Leicester Paint & Hardware Co., Leicester	85	Aug.
D-409	Crosby's Early Egyptian Beets..... La Palme Hardware Co., Webster	78	Aug.
D-410	Early Wonder Beets..... Ross Brothers Co., Worcester	70	Aug.
D- 72	F. H. WOODRUFF & SONS, Milford, Conn. Detroit Dark Red Beets..... Agawam Public Market, Agawam	95	Aug.
D-411	Detroit Dark Red Beets..... Crown Paint & Paper Co., North Adams	77	Aug.
D-412	Large Red Mammoth Beets..... Peirson Hardware Co., Pittsfield	70	Aug.
D- 73	S. D. WOODRUFF & SONS, Orange, Conn. Edmund Blood Beets..... J. H. Fairbanks & Co., Bridgewater	88	Aug.
D-413	Early Blood Turnip Beets..... Central Hardware Co., Fitchburg	75	Aug.
BROCCOLI			
D- 74	JOSEPH BRECK & SONS CORP., Boston, Mass. Broccoli (Calabrese)..... Russell R. Cameron, Cambridge	72	July
D- 75	CHARLES C. HART SEED CO., Wethersfield, Conn. Italian Green Calabrese Broccoli..... H. R. Durant, Belchertown	78	July
D- 76	Italian Early Green Calabrese Broccoli..... Arthur C. Lamson, Inc., Marlboro	41	July
D- 77	JEROME B. RICE SEED CO., Cambridge, N. Y. Italian Green Sprouting Broccoli..... Bartlett & Dow Co., Lowell	75	July
D- 78	Italian Green Sprouting Broccoli..... C. A. Noyes & Co., Brockton	88	July
BRUSSELS SPROUTS			
D- 79	LAKE SHORE SEED CO., Dunkirk, N. Y. Brussels Sprouts..... C. A. Gifford Estate, Westport	18 (R)	July
D- 80	JEROME B. RICE SEED CO., Cambridge, N. Y. Long Island Improved Brussels Sprouts..... Bartlett & Dow Co., Lowell	80	July
D- 81	Carters Brussels Sprouts..... Clark Hardware Co., Greenfield	81	July
D- 82	Brussels Sprouts..... C. A. Noyes & Co., Brockton	82	July
CABBAGE			
D- 83	JOSEPH BRECK & SONS CORP., Boston, Mass. Savoy Cabbage..... John A. Geb, Franklin	72	July
D-414	Warren's Stone Mason Cabbage..... Bent's Hardware, Brighton	63	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
CABBAGE — Continued			
D-415	COMSTOCK, FERRE & CO., Wethersfield, Conn. Golden Acre Cabbage..... J. O. Neill Hardware, Fall River	84	Aug.
D- 84	THE CONTINENTAL NURSERIES, Franklin Drumhead Savoy Cabbage..... A. J. Cataldo's Sons, Clark Square, Franklin	58	July
D-416	THOMAS W. EMERSON CO., Boston, Mass. Savoy Cabbage..... Lockhart Hardware Co., Natick	92	Aug.
D- 85	CHARLES C. HART SEED CO., Wethersfield, Conn. Danish Ballhead Cabbage..... Fiske Corporation, Natick	81	July
D- 86	Early Green Curled Savoy Cabbage..... Waverly Hardware Co., West Newton	75 (R)	July
D-417	Copenhagen Market Cabbage..... Fiske Corp., Natick	84	Aug.
D-418	LAKE SHORE SEED CO., Dunkirk, N. Y. Danish Ballhead Cabbage..... Lockhart Hardware Co., Natick	28	Aug.
D-419	LEONARD SEED CO., Chicago, Ill. Henderson's Early Summer Cabbage..... J. William Gove, Inc., Foxboro	26	Aug.
D-420	Stone Mason Drum Head Cabbage..... J. William Gove, Inc., Foxboro	59	Aug.
D- 87	NORTHROP, KING & CO., Minneapolis, Minn. Early Jersey Wakefield Cabbage..... Central Square Hardware Co., Cambridge	81	July
D- 88	Prem. Late Flat Dutch Cabbage..... Russell R. Cameron, Cambridge	94	July
D- 89	Early Jersey Wakefield Cabbage..... Pierce-Millbury Hardware Co., Millbury	67	July
D-421	Early Dwarf Flat Dutch Cabbage..... Russell R. Cameron, Cambridge	77	Aug.
D-422	Early Jersey Wakefield Cabbage..... Norwood Hardware & Supply Co., Norwood	95	Aug.
D-423	Copenhagen Cabbage..... Norwood Hardware & Supply Co., Norwood	81	Aug.
D-424	Late Flat Dutch Cabbage..... Norwood Hardware & Supply Co., Norwood	96	Aug.
D- 90	JEROME B. RICE SEED CO., Cambridge, N. Y. Rice Premium Late Flat Dutch Cabbage..... T. F. Ayers, Shrewsbury	83	July
D-425	Premium Late Flat Dutch Cabbage..... Lockhart Hardware Co., Natick	86	Aug.
D-426	Warren's Stone Mason Cabbage..... Thompson Hardware Co., Lowell	81	Aug.
D-427	Ex. Early Jersey Wakefield Cabbage..... Central Square Hardware Co., Cambridge	73	Aug.
D- 91	ROSS BROS. CO., Worcester, Mass. Copenhagen Market Cabbage..... George G. Henry, Ashfield	77	July
D- 92	F. H. WOODRUFF & SONS, Milford, Conn. Danish Ballhead or Hollander Cabbage..... Union Hardware Co., Fitchburg	84	July

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>CABBAGE — Concluded</b>			
D- 93	Stone Mason Cabbage..... Oscar T. Gove, Market Square, Amesbury	90	July
D- 94	All Seasons Cabbage..... Haverhill Hardware & Plumbing Supply Co., Haverhill	84	July
D- 95	Danish Ballhead Cabbage..... S. Allen's Sons, Greenfield	83	July
D- 96	S. D. WOODRUFF & SONS, Orange, Conn. Danish Winter Ball Head Cabbage..... Danvers Hardware Co., Danvers	58	July
<b>CARROTS</b>			
D- 97	JOSEPH BRECK & SONS CORP., Boston, Mass. Danvers Half Long Carrot..... Russell R. Cameron, Cambridge	84 (R)	Aug.
D-428	Long Orange Carrots..... Flotos Hardware, Inc., Brighton	75	Aug.
D-429	Early Scarlet Forcing Carrots..... Joseph Breck & Sons Corp., Boston	51	Aug.
D-430	Early Scarlet Horn Carrots..... Joseph Breck & Sons Corp., Boston	43	Aug.
D-431	Large White Belgian Carrots..... Joseph Breck & Sons, Boston	52	Aug.
D-432	Ox Heart Carrots..... Franklin D. Williams, Taunton	59	Aug.
D-433	COMSTOCK, FERRE & CO., Wethersfield, Conn. Short Horn Carrots..... J. O. Neill Hardware Co., Fall River	70	Aug.
D- 98	THOMAS W. EMERSON CO., Boston, Mass. Hutchinson Carrots..... W. G. Pearse Co., Fall River	82	Aug.
D-434	Imp. Long Orange Carrots..... Brownell's Hardware Co., Attleboro	70	Aug.
D-435	D. M. FERRY & CO., Detroit, Mich. Chantenay Carrots..... Flotos Hardware Inc., Brighton	63	Aug.
D-436	FREDONIA SEED CO., Fredonia, N. Y. Ox Heart Carrots..... Wright & Fletcher, Westford	56	Aug.
D- 99	CHARLES C. HART SEED CO., Wethersfield, Conn. Imp. Long Orange Carrots..... Fiske Corp., Natick	73 (R)	Aug.
D-437	LAKE SHORE SEED CO., Dunkirk, N. Y. Danvers Half Long Carrots..... C. A. Gifford Estate, Westport	37	Aug.
D-100	NORTHROP, KING CO., Minneapolis, Minn. Imp. Danvers Half Long Carrots..... Russell R. Cameron, Cambridge	61 (R)	Aug.
D-101	Improved Danvers Half Long Carrots..... S. C. French, Royalston	54	Aug.
D-102	PAGE SEED CO., Greene, N. Y. Chantenay Carrot..... E. M. Gould, Shelburne Falls	55	Aug.
D-438	PERRY SEED CO., Boston, Mass. Early Scarlet Horn Carrots..... Perry Seed Co., Boston	60	Aug.
D-439	Nantes Half Long Carrots..... Perry Seed Co., Boston	60	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>CARROTS — Concluded</b>			
D-103	JEROME B. RICE SEED CO., Cambridge, N. Y. New Oxheart Orange Carrot..... Central Square Hardware Co., Cambridge	87	Aug.
D-104	True Danvers Half Long Carrots..... W. K. Hadsell, Hancock	46	Aug.
D-105	Early French Short Horn, or Early Scarlet Horn Carrots..... T. F. Ayers, Shrewsbury	58 (R)	Aug.
D-106	ROSS BROS. CO., Worcester, Mass. Long Orange Carrots..... G. R. Norton, Otis	71	Aug.
D-107	F. H. WOODRUFF & SONS, Milford, Conn. Coreless Chantenay Carrots..... Haverhill Hardware & Plumbing Co., Haverhill	77	Aug.
D-108	S. D. WOODRUFF & SONS, Orange, Conn. Danvers Half Long Carrots..... Danvers Hardware Co., Danvers	61	Aug.
<b>CAULIFLOWER</b>			
D-441	JOSEPH BRECK & SONS, Boston, Mass. Veitch's Autumn Giant Cauliflower..... Joseph Breck & Sons, Boston	93	Aug.
D-442	Breck's White Bouquet Cauliflower..... Joseph Breck & Sons, Boston	90	Aug.
D-443	Early London Cauliflower..... Joseph Breck & Sons, Boston	56	Aug.
D-109	FERRY-MORSE SEED CO., Detroit & San Francisco Early Snowball Cauliflower..... John Degano & Son, Granville	81	Aug.
D-110	Early Snowball Cauliflower..... Whitcomb-Carter Co., Beverly	78	Aug.
D-111	LAKE SHORE SEED CO., Dunkirk, N. Y. Snowball Cauliflower..... T. E. Borden, North Westport	38	Aug.
D-112	PERRY SEED CO., Boston, Mass. Danish Giant Cauliflower..... Perry Seed Co., Boston	63	July
D-113	Ex. Early D. Erfurt Cauliflower..... Perry Seed Co., Boston	13	Aug.
D-114	JEROME B. RICE SEED CO., Cambridge, N. Y. Henderson's Early Snowball Cauliflower..... Fred E. Daisy, Carlisle Center	69	Aug.
D-115	SUHR (Address unknown) Danish Snowball Early Cauliflower..... Eastern States Farmers' Ex., Springfield	80	Aug.
D-116	ZWAAN & VAN DER MOLLEN, INC., Voorburg-The Hague Zwaan's Snowdrift Cauliflower..... Jose J. D'Arruda, Fall River	85	Aug.
<b>CELERY</b>			
D-117	JOSEPH BRECK & SONS CORP., Boston, Mass. Boston Market Celery..... Russell R. Cameron, Cambridge	81	Aug.
D-118	FERRY-MORSE SEED CO., Detroit White Plume Celery..... Whitcomb-Carter Co., Beverly	75	July
D-119	FREDONIA SEED CO., Fredonia, N. Y. Giant Pascal Celery..... Wright & Fletcher, Westford	60 (R)	July

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>CELERY — Concluded</b>			
D-120	JEROME B. RICE SEED CO., Cambridge, N. Y. White Plume Celery..... C. A. Noyes & Co., Brockton	90	Aug.
D-121	Dwarf Golden Self-Blanching Celery..... T. F. Ayers, Shrewsbury	68	Aug.
D-122	F. H. WOODRUFF & SONS, Milford, Conn. Giant Pascal Celery..... Martin W. Dugan Co., Newburyport	32	July
D-123	Giant Pascal Celery..... Union Hardware Co., Fitchburg	68	July
<b>SWEET CORN</b>			
D-124	JOSEPH BRECK & SONS CORP., Boston, Mass. Golden Bantam Corn..... L. E. Smith Co., Gloucester	94	Aug.
D-125	Platt's Strain Stowell's Evergreen Corn..... Brockton Hardware & Supply Co., Brockton	80	Aug.
D-126	Golden Bantam Corn..... Brockton Hardware & Supply Co., Brockton	90	Aug.
D-127	Early Sensation Corn..... C. B. Coburn & Co., Lowell	92	Aug.
D-129	THOMAS W. EMERSON CO., Boston, Mass. Golden Giant Corn..... Plymouth Rock Hardware Co., Plymouth	91	Aug.
D-131	Golden Giant Corn..... H. A. Spear & Son, Walpole	90	Aug.
D-132	Golden Sunrise Corn..... W. C. Fuller & Co., Mansfield	96	Aug.
D-133	Early Crosby Corn..... W. C. Fuller Co., Mansfield	96	Aug.
D-134	Golden Sunrise Corn..... W. R. Hill Hardware, Andover	96	Aug.
D-137	Golden Surprise Sweet Corn..... The O. B. Parks Co., Westfield	94	Aug.
D-138	Golden Sunshine Corn..... Gruener Hardware Store, Fitchburg	95	Aug.
D-162	Golden Bantam Corn..... Howe Bros., Abington	90	July
D-163	Early Golden Sunrise Sweet Corn..... Ryther & Warren, Belchertown	95	July
D-164	Golden Bantam Sweet Corn..... Fiske Corporation, Natick	80	July
D-139	FERRY-MORSE SEED CO., Detroit and San Francisco Golden Bantam Corn..... Diamond Hardware Store, East Milton	92	Aug.
D-141	CHARLES C. HART SEED CO., Wethersfield, Conn. Whipple's Early Yellow Sweet Corn..... Waite Hardware Co., Worcester	95	Aug.
D-142	LEONARD SEED CO., Chicago, Ill. Bantam Evergreen Sweet Corn..... A. E. Stewart Estate, Athol	72	Aug.
D-143	Golden Sunshine Sweet Corn..... Hamilton & Atwater, Westfield	97	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>SWEET CORN — Concluded</b>			
D-144	Golden Bantam Corn..... F. W. Carson, Quincy	88	Aug.
D-145	NORTHRUP, KING & CO., Minneapolis, Minn. Extra Early Golden Bantam Sweet Corn..... Robert Allison, East Pepperell	91	Aug.
D-146	PAGE SEED CO., Green, N. Y. Golden Bantam Corn..... F. J. Noel, Lancaster	92	Aug.
D-147	Black Mexican Corn..... H. S. Packard, Cummington	97	Aug.
D-149	Golden Bantam Corn..... Henry L. Sawyer, Framingham	96	Aug.
D-150	JEROME B. RICE SEED CO., Cambridge, N. Y. Golden Sunshine Corn..... H. B. Blye, Woburn	86	Aug.
D-151	Black Mexican Sweet Corn..... Clark Hardware Co., Greenfield	94	Aug.
D-152	Bantam Evergreen Sweet Corn..... Berkshire Coal & Grain Co., Inc., North Adams	93	Aug.
D-153	Black Mexican Sweet Corn..... Sinclair Hardware Co., Medford	93	Aug.
D-154	Early Crosby Corn..... Sherman Hardware Co., Plymouth	90	July
D-155	Black Mexican Corn..... Payne Cummings Hardware Co., North Adams	80	July
D-156	Golden Bantam Sweet Corn..... Danaher's Hardware Co., Williamstown	83	July
D-157	ROSS BROS., Worcester, Mass. Golden Bantam Sweet Corn..... Leicester Paint & Hardware, Leicester	95	July
D-135	F. H. WOODRUFF & SONS, Milford, Conn. Extra Early Yellow Sweet Corn..... Marlboro Hardware Co., Marlboro	84	Aug.
D-136	Golden Bantam Sweet Corn..... Union Hardware Co., Fitchburg	85	Aug.
D-159	Whipple's Early Yellow Sweet Corn..... Ferry and Bardwell, Feeding Hills, Mass.	85	July
D-160	Imperial Golden Bantam Sweet Corn..... Martin W. Dugan Co., Newburyport	92	July
D-161	Long Island Beauty Sweet Corn..... Frank, The Seedman, Springfield	91	July
<b>CRESS</b>			
D-165	FERRY-MORSE SEED CO., Detroit and San Francisco True Water Cress..... R. W. Newdick, Marshfield	71	July
D-166	LAKE SHORE SEED CO., Dunkirk, N. Y. Cress..... S. R. McIntosh, Wilmington	62	Aug.
D-167	D. LANDRETH SEED CO., Bristol, Pa. Upland Cress..... Elwood Adams, Inc., Worcester	91	Aug.
<b>CUCUMBER</b>			
D-168	JOSEPH BRECK & SONS CORP., Boston, Mass. Davis Perfect Cucumber..... C. G. McMullin, Newton	85	July



## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>CUCUMBER — Continued</b>			
D-169	White Spine Cucumber..... Whitcomb-Carter Co., Beverly	90	July
D-170	White Spine Cucumber..... Flotos Hardware, Inc., Brighton	95	July
D-457	Klondike Cucumber..... Joseph Breck & Sons Corp., Boston	86	Aug.
D-458	Sunny South Cucumber..... Joseph Breck & Sons Corp., Boston	91	Aug.
D-459	COMSTOCK, FERRE & CO., Wethersfield, Conn. Early Fortune Cucumber..... Jose J. D'Arruda, Fall River	98	Aug.
D-460	THOMAS W. EMERSON CO., Boston, Mass. Davis Perfect Cucumber..... Brownells' Hardware Co., Attleboro	92	Aug.
D-463	Improved Long Green Cucumber..... Orange Hardware, Orange	96	Aug.
D-171	FERRY-MORSE CO., Detroit & San Francisco Lemon Cucumber..... R. W. Newdick, Marshfield	88	July
D-172	Improved Long Green Cucumber..... Flotos Hardware, Inc., Brighton	67	July
D-461	Early Short Green Cucumber..... Henry Duncan Corp., Winchester	60	Aug.
D-173	CHARLES C. HART SEED CO., Wethersfield, Conn. Improved Long Green Cucumber..... J. J. Tebo, Grafton	97	July
D-174	Boston Pickling Cucumber..... H. A. Spear & Son, Walpole	79	July
D-175	Early Cluster Cucumber..... John A. Geb, Franklin	93	July
D-176	LAKE SHORE SEED CO., Dunkirk, N. Y. Improved Long Green Cucumber..... Bent's Hardware, Brighton	47	July
D-464	LEONARD SEED CO., Chicago, Ill. Davis Perfect Cucumber..... Hamilton & Atwater, Westfield	90	Aug.
D-177	NORTHRUP, KING & CO., Minneapolis, Minn. Improved Long Green Cucumber..... A. L. Avery & Son, Charlemont	96	July
D-462	PAGE SEED CO., Greene, N. Y. Davis Perfect Cucumber..... Arthur E. Wills, Medfield	64	Aug.
D-178	PERRY SEED CO., Boston, Mass. Cumberland Cucumber..... Perry Seed Co., Boston	71	July
D-179	Japanese Climbing Cucumber..... Perry Seed Co., Boston	37	July
D-180	Early Russian Cucumber..... Perry Seed Co., Boston	48	July
D-181	West India Gherkin Cucumber..... Perry Seed Co., Boston	78	July
D-465	JEROME B. RICE CO., Cambridge, N. Y. Long Green Cucumber..... Danaker Hardware Co., Williamstown	88	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
CUCUMBER — Concluded			
D-467	Improved Early White Spine Cucumber..... And. F. Curtin & Sons, Medford	81	Aug.
D-182	ROSS BROS. CO., Worcester, Mass. Early White Spine Cucumber..... Newton Corner Hardware Co., Newton	87 (R)	July
D-183	F. H. WOODRUFF & SONS, Milford, Conn. Davis Perfect Cucumber..... Oscar T. Gove, Amesbury	82 (R)	July
D-184	Improved White Spine Cucumber..... Ferry & Bardwell, Feeding Hills	97	July
D-466	Woodruff's Hybrid Cucumber..... Haverhill Hardware & Plumbing, Haverhill	95	Aug.
D-185	S. D. WOODRUFF & SONS, Orange, Conn. Long Green Cucumber..... Danvers Hardware Co., Danvers	98	July
ENDIVE			
D-186	CHARLES C. HART SEED CO., Wethersfield, Conn. Curled Endive..... J. J. Tebo, Grafton	72	July
D-187	BUDD D. HAWKINS, Reading, Vt. Green Curled or Giant Fringed Oyster Endive..... W. T. Richards & Son, Erving	87	July
D-188	NORTHROP, KING & CO., Minneapolis, Minn. Broad Leaved Batavian Endive..... Russell R. Cameron, Cambridge	65	July
D-189	PAGE SEED CO., Greene, N. Y. Moss Curled Endive..... Arthur E. Wills, Medfield	89	July
D-190	F. H. WOODRUFF & SONS, Milford, Conn. Broad Leaved Batavian Endive..... Union Hardware Co., Fitchburg	91	July
KALE			
D-191	FERRY-MORSE SEED CO., Detroit, Mich. Tall Green Curled Scotch Kale or Borecole..... Whitecomb-Carter Co., Beverly	74	July
D-192	Siberian Kale..... Sears, Roebuck & Co., Quincy	70	July
D-193	CHARLES C. HART SEED CO., Wethersfield, Conn. Dwarf Green Curled Scotch Kale..... H. R. Durant, Belchertown	89	July
D-194	NORTHROP, KING & CO., Minneapolis, Minn. Dwarf Green Curled Kale..... Robert Allison, East Pepperell	48	July
KOHL RABI			
D-195	NORTHROP, KING & CO., Minneapolis, Minn. Early White Kohl Rabi..... Shattuck Stores Co., Inc., Groton	67	July
D-196	F. H. WOODRUFF & SONS, Milford, Conn. White Kohl Rabi..... Union Hardware Co., Fitchburg	58	July
D-197	White Kohl Rabi..... Frank, The Seedman, Springfield	82	July
D-198	S. D. WOODRUFF & SONS, Orange, Conn. Purple Vienna Kohl Rabi..... L. E. Smith Co., Gloucester	36	July

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
LETTUCE			
D-199	JOSEPH BRECK & SONS CORP., Boston, Mass. Boston Curled Lettuce..... L. E. Smith Co., Gloucester	64	Aug.
D-200	FERRY-MORSE SEED CO., Detroit, Mich. Early Prize Head Lettuce..... Henry Duncan Corp., Winchester	73	Aug.
D-201	Black-seeded Simpson Lettuce..... Henry Duncan Corp., Winchester	92	Aug.
D-468	Big Boston Lettuce..... Frank W. Richardson, Waltham	89	Aug.
D-202	CHARLES C. HART SEED CO., Wethersfield, Conn. Romaine or White Cos Lettuce..... Longmeadow Public Market, Longmeadow	54	Aug.
D-203	Hansen Lettuce..... C. F. Page & Co., Athol	87	Aug.
D-204	Big Boston Head Lettuce..... Charles A. Fiske, Granby.	84 (R)	Aug.
D-470	Romaine, or White Cos Lettuce..... Waverly Hardware Co., West Newton	54	Aug.
D-205	BUDD D. HAWKINS, Reading, Vt. Black-seeded Simpson Lettuce..... Derby Stores, Inc., Ashby	94	Aug.
D-206	LAKE SHORE SEED CO., Dunkirk, N. Y. Early Curled Silesia Lettuce..... Bents Hardware, Brighton	30	Aug.
D-207	Green Ice Head Lettuce..... J. William Gove, Inc., Foxboro	27	Aug.
D-208	NORTHROP, KING & CO., Minneapolis, Minn. Grand Rapids Lettuce..... Diamond Hardware Co., Milton	64	Aug.
D-471	New York Special or Los Angeles Lettuce..... Newton Corner Hardware Co., Newton	74	Aug.
D-472	PAGE SEED CO., Greene, N. Y. Romaine or Cos Lettuce..... Henry L. Sawyer, Framingham	85	Aug.
D-473	Iceberg Lettuce..... Henry L. Sawyer, Framingham	93	Aug.
D-209	JEROME B. RICE SEED CO., Cambridge, N. Y. Grand Rapids Lettuce..... W. K. Hadselle, Hancock	64	Aug.
D-210	Early Prize Head Lettuce..... Holstrom Bros., Auburn	74	Aug.
D-211	Early Prize Head Lettuce..... E. M. Gould, Shelburne Falls	70 (R)	Aug.
D-474	Boston Curled Lettuce..... Arthur C. Lamson, Inc., Marlboro	11	Aug.
D-475	Hanson Lettuce..... Arthur C. Lamson, Inc., Marlboro	66	Aug.
D-476	ROSS BROS. CO., Worcester Big Boston Lettuce..... Newton Corner Hardware, Newton	93	Aug.
D-212	F. H. WOODRUFF & SONS, Milford, Conn. Simpson's White Seed or Early Curled Silesia Lettuce..... Union Hardware Co., Fitchburg	68 (R)	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
LETTUCE — Concluded			
D-213	Prize Head Lettuce..... Martin W. Dugan Co., Newburyport	94	Aug.
D-214	New York Wonderful Lettuce..... S. Allen's Sons, Greenfield	98	Aug.
D-477	Romaine or Cos Lettuce..... Boston Supply Inc., Framingham	94	Aug.
D-478	Big Boston Lettuce..... Boston Supply Inc., Framingham	91	Aug.
MUSKMELON			
D-215	JOSEPH BRECK & SONS CORP., Boston, Mass. Golden Champlain Melon..... Franklin D. Williams, Taunton	90	Aug.
D-218	COMSTOCK, FERRE & CO., Wethersfield, Conn. Bender's Surprise Muskmelon..... Carlisle Hardware Co., Springfield	91	Aug.
D-216	THOMAS W. EMERSON CO., Boston, Mass. Rocky Ford Melon..... H. A. Spear & Son, Walpole	83	Aug.
D-217	Emerald Gem Muskmelon..... L. E. Smith Co., Gloucester	96	Aug.
D-219	FERRY-MORSE CO., Detroit, Mich. Citron Melon..... R. W. Newdick, Marshfield	76	Aug.
D-220	CHARLES C. HART SEED CO., Wethersfield, Conn. Bender's Surprise Muskmelon..... Central Hardware Co., Winchester	75	Aug.
D-221	D. LANDRETH SEED CO., Bristol, Pa. Honey Dew Cantaloupe..... Hampshire Hardware Co., Northampton.	93	Aug.
D-222	NORTHROP, KING & CO., Minneapolis, Minn. Tip Top Melon..... S. R. McIntosh, Wilmington	92	Aug.
D-223	JEROME B. RICE SEED CO., Cambridge, N. Y. Emerald Gem Muskmelon..... S. R. McIntosh, Wilmington	91	Aug.
D-224	Tip Top Muskmelon..... And. F. Curtin & Sons, Medford	93	Aug.
D-225	Banana Cantaloupe..... G. E. Doane Hardware, Middleboro	100	Aug.
D-227	F. H. WOODRUFF & SONS, Milford, Conn. Miller's Cream Muskmelon..... Ferry & Bardwell, Feeding Hills	86	Aug.
D-228	Rocky Ford Muskmelon..... Frank, The Seedman, Springfield	92	Aug.
D-229	Orange Flesh Cantaloupe..... S. Allen's Sons, Greenfield	85	Aug.
ONIONS			
D-231	JOSEPH BRECK & SONS CORP., Boston, Mass. Danvers Onion..... A. H. Whidden & Son, Inc., Peabody	93	Aug.
D-479	COMSTOCK, FERRE & CO., Wethersfield, Conn. Prizetaker Onion..... Carlisle Hardware Co., Springfield	90	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
ONIONS — Concluded			
D-480	CROSSMAN SEED CO., Rochester, N. Y. Bunching Onion..... S. S. Kresge Co., Northampton	88	Aug.
D-232	THOMAS W. EMERSON CO., Boston, Mass. Red Wethersfield, Onion..... Millis Coal & Grain Co., Millis	72	Aug.
D-481	Yellow Globe Danvers Onion..... Waite Hardware Co., Webster	94	Aug.
D-233	FERRY-MORSE SEED CO., Detroit, Mich. Queen Onion..... Norwood Hardware Supply Co., Norwood	88	Aug.
D-482	Sweet Spanish Onion..... Elwood Adams, Inc., Worcester	90	Aug.
D-483	CHARLES C. HART SEED CO., Wethersfield, Conn. Yellow Globe Danvers Onion..... Fitchburg Hardware Co., Fitchburg	64	Aug.
D-234	BUDD D. HAWKINS, Reading, Vt. Large Red Wethersfield Onion..... D. L. Chamberlin, Carlisle Center	45	Aug.
D-484	Large Red Wethersfield Onion..... A. E. Stewart Estate, Athol	40	Aug.
D-235	LAKE SHORE SEED CO., Dunkirk, N. Y. Large Yellow Danvers Onion..... Bents Hardware Co., Brighton	14.5	Aug.
D-485	LEONARD SEED CO., Chicago, Ill. Yellow Globe Onion..... Hamilton & Atwater, Westfield	86	Aug.
D-236	JEROME B. RICE SEED CO., Cambridge, N. Y. Prizetaker Onion..... And. F. Curtin & Sons, Medford	84	Aug.
D-486	White Portugal, or Silver Skin Onion... Pierce-Millbury Hardware Co., Millbury	86	Aug.
D-487	ROSS BROS. CO., Worcester Prizetaker Onion..... Ross Bros. Co., Worcester	95	Aug.
D-488	Southport Red Globe Onion..... Ross Bros. Co., Worcester	91	Aug.
D-489	F. H. WOODRUFF & SONS, Milford, Conn. White Globe Onion..... Berkshire Hardware Co., Pittsfield	4	Aug.
D-490	Southport Yellow Globe..... Crown Paint & Paper Co., North Adams	58	Aug.
D-491	Red Wethersfield Onion..... Frank, The Seedman, Springfield	98	Aug.
D-492	S. D. WOODRUFF & SONS, Orange, Conn. Yellow Globe Danvers..... Central Hardware Co., Fitchburg	75	Aug.
PARSLEY			
D-237	ASSOCIATED SEED GROWERS,*Milford, Conn. Moss Curled Parsley, Lot No. 23B.1334..... Eastern States Farmers' Ex., Springfield	75	July
D-493	JOSEPH BRECK & SONS, Boston, Mass. Early Moss Curled Parsley..... P. R. Winters, Belmont	68	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>PARSLEY — Concluded</b>			
D-494	COMSTOCK, FERRE & CO., Wethersfield, Conn. Plain Parsley..... Carlisle Hardware Co., Springfield	70	Aug.
D-495	EASTERN STATES FARMERS EX., Worcester Emerald Dwarf Moss Curled..... Eastern States Farmers Ex., Worcester	83	Aug.
D-238	FREDONIA SEED CO., Fredonia, N. Y. Long Root — Hamburg Parsley..... H. W. Jordan, Carver	47 (R)	July
D-497	Plain Broad Leaved Parsley..... A. H. Phillips, Belchertown	38	Aug.
D-498	Double Curled Parsley..... M. F. Packard, Worthington	47	Aug.
D-239	CHARLES C. HART SEED CO., Wethersfield, Conn. Hamburg Parsley..... Arthur C. Lamson, Inc., Marlboro	45	July
D-500	Italian, or Plain Leaf Parsley..... R. E. Faulkner, Palmer	68	Aug.
D-240	LAKE SHORE SEED CO., Dunkirk, N. Y. Double Curled Parsley..... Joe Niedbala, Hadley	33	July
D-241	Double Curled Parsley..... J. William Gove, Inc., Foxboro	29	July
D-502	D. LANDRETH SEED CO., Bristol, Pa. Champion Moss Curled Parsley..... Elwood-Adams, Inc., Worcester	59	Aug.
D-243	NORTHROP, KING & CO., Minneapolis, Minn. Dark Moss Curled Parsley..... H. I. Ford, Hanover	53	July
D-244	JEROME B. RICE SEED CO., Cambridge, N. Y. Champion Moss Curled Parsley..... Boston Supply, Inc., Framingham	45	July
D-245	Champion Moss Curled Parsley..... G. Canovaro, Kingston	31	July
D-503	Champion Moss Curled Parsley..... Holmstrom Bros., Auburn	47	Aug.
D-246	F. H. WOODRUFF & SONS, Milford, Conn. Hamburg or Rooted Parsley..... Martin W. Dugan Co., Newburyport	47	July
<b>PARSNIPS</b>			
D-247	JOSEPH BRECK & SONS CORP., Boston, Mass. Hollow Crown Parsnip..... A. H. Whidden & Son, Inc., Peabody	70	July
D-248	THOMAS W. EMERSON CO., Boston, Mass. Hollow Crown Parsnip..... L. S. Field, Montague	70	July
D-249	CHARLES C. HART SEED CO., Wethersfield, Conn. Hollow Crown Parsnip..... Longmeadow Public Market, Longmeadow	60	July
D-250	Hollow Crown Parsnip..... Shattuck Stores Co., Inc., Groton	43	July
D-252	NORTHROP, KING & CO., Minneapolis, Minn. Sweet Marrow Parsnip..... H. I. Ford, Hanover	66	July
D-253	ROSS BROS. CO., Worcester, Mass. Hollow Crown Parsnip..... L. E. Hawes, Sudbury	80.5	July

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
PEAS			
JOSEPH BRECK & SONS CORP., Boston, Mass.			
D-254	Hundredfold Peas..... J. E. Jordan Hardware Co., Plymouth	98	July
D-255	Laxton Peas..... Winer's, Inc., Quincy	91	July
D-256	Hundredfold Peas..... C. B. Coburn & Co., Lowell	96	July
D-257	World's Record Peas..... Whitcomb-Carter Co., Beverly	91	July
D-258	Improved Telephone Peas..... C. B. Coburn & Co., Lowell	86	July
D-259	The Record Peas..... E. E. Bickford & Co., Hingham	78	July
THOMAS W. EMERSON CO., Boston, Mass.			
D-260	American Wonder Peas..... Plymouth Rock Hardware Co., Plymouth	83	July
D-261	Sutton's Excelsior Peas..... W. R. Hill Hardware, Andover	94	Aug.
D-262	Dwarf Defiance Peas..... W. G. Pearce Co., Fall River	91	July
D-263	Carter's Telephone Peas..... Howe Bros., Abington	76	July
D-264	Excelsior Peas..... Waverly Hardware Co., West Newton	92	July
D-265	Hundredfold Peas..... The O. B. Parks Co., Westfield	98	July
D-266	Little Marvel Peas..... Orange Hardware Co., Orange	75	July
D-267	Gradus Peas..... Gruener Hardware Store, Fitchburg	85	July
D-268	Alderman Peas..... L. S. Field, Montague	92	July
D-269	Telephone Peas..... Waverly Hardware Co., West Newton	84	July
D-270	Everbearing Peas..... W. C. Fuller & Co., Mansfield	90	July
D-271	Champion of England, Late Peas..... Brownell's Hardware Co., Attleboro	82	July
D-272	Thomas Laxton Peas..... Arthur E. Wills, Medfield	93	July
D-273	Alaska Extra Early Peas..... Brownell's Hardware Co., Attleboro	93	July
D-274	Telephone Peas..... H. A. Spears & Son, Walpole	80	July
R. FAULKNER, Palmer, Mass.			
D-275	Nott's Excelsior Peas..... L. H. Thompson, Wales	92	July
CHARLES C. HART SEED CO., Wethersfield, Conn.			
D-276	Tall Telephone Peas..... Frank W. Richardson, Waltham	90	July
D-277	Nott's Excelsior Peas..... Waite Hardware Co., Worcester	93	July

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
PEAS — Concluded			
D-278	Thomas Laxton Peas..... C. F. Page & Co., Athol	93	July
D-279	Laxton's Progress Peas..... Federal Supply Co., Northampton	92	July
D-280	LEONARD SEED CO., Chicago, Ill. Gradus Peas..... F. W. Carson, Quincy	64 (R)	July
D-281	Gradus Peas..... A. E. Stewart Estate, Athol	87	July
D-282	Dwarf Champion Peas..... Pierce Hardware Co., Taunton	85	July
D-283	NORTHRUP, KING & CO., Minneapolis, Minn. American Wonder Peas..... Norwood Hardware Supply Co., Norwood	97	July
D-284	THE PAGE SEED CO., Greene, N. Y. Telephone Peas..... Cassidy Bros., Sheffield	90	July
D-285	Sutton's Excelsior Peas..... H. S. Packard, Cummington	90	July
D-286	Nott's Excelsior Peas..... The Clifford Co., Lenox	92	July
D-287	Early Dwarf Little Marvel Peas..... Henry L. Sawyer, Framingham	81 (R)	July
D-288	JEROME B. RICE SEED CO., Cambridge, N. Y. Gradus Low Bush Peas..... Sherman Hardware Co., Plymouth	92	July
D-289	Telephone Peas..... R. A. Stacey Seed Co., Williamstown	93	July
D-290	Pioneer Peas..... Clark Hardware Co., Greenfield	90	July
D-291	Thomas Laxton Peas..... Payne-Cummings Hardware Co., North Adams	96	July
D-292	Prince Edward Peas..... Pierce Seed Co., Taunton	82	July
D-293	Laxtonian Peas..... H. B. Blye & Co., Woburn	93	July
D-294	ROSS BROS., Worcester, Mass. Sutton's Excelsior Peas..... LaPalme Hardware Co., Webster	91	July
D-295	Blue Bantam Peas..... C. W. Robinson, Brimfield	85	July
D-296	F. H. WOODRUFF & SONS, Milford, Conn. Sutton's Excelsior Peas..... Ferry & Bardwell, Feeding Hills	63	July
D-297	Laxton's Progress Peas..... W. C. Ring, Palmer	93	July
D-298	Peter Pan Peas..... Schilling & Noble, Stockbridge	80	Aug.
D-299	Champion of England Peas..... S. Allen's Sons, Greenfield	91	Aug.
D-300	Dwarf Telephone Peas..... The Thompson Hardware Co., Lowell	82	Aug.
D-301	Laxtonia Peas..... Oscar T. Gove, Amesbury	94	Aug.



## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>PEPPER</b>			
D-302	CHARLES C. HART SEED CO., Wethersfield, Conn. Sweet Mountain Pepper..... Charles A. Fiske, Granby	62	Aug.
D-303	JEROME B. RICE SEED CO., Cambridge, N. Y. Ruby King Pepper..... Boston Supply, Inc., Framingham	82	Aug.
D-304	Harris Earliest Pepper..... And. F. Curtin & Sons, Medford	59	Aug.
D-305	F. H. WOODRUFF & SONS, Milford, Conn. Hot Bull Nose Pepper..... J. B. Sibley & Son, Ware	51	Aug.
<b>PUMPKIN</b>			
D-306	JOSEPH BRECK & SONS CORP., Boston, Mass. Small Sugar Pumpkin..... E. E. Bickford Co., Hingham	46 (R)	Aug.
D-307	THE CONTINENTAL NURSERIES, Franklin, Mass. Cheese Pumpkin..... A. J. Cataldo's Sons, Franklin	84	Aug.
D-308	THOMAS W. EMERSON CO., Boston, Mass. Sweet or Sugar Pumpkin..... W. G. Pearse, Fall River	61 (R)	Aug.
D-309	FERRY-MORSE SEED CO., Detroit, Mich. Large Yellow Pumpkin..... Norwood Hardware Supply Co., Norwood	82 (R)	Aug.
D-310	NORTHRUP, KING & CO., Minneapolis, Minn. Early Sugar or Pie Pumpkin..... Sam's Auto Supply, Norwood	64	Aug.
D-311	JEROME B. RICE SEED CO., Cambridge, N. Y. Sweet or Sugar Pumpkin..... Clark Hardware Co., Greenfield	66 (R)	Aug.
D-312	F. H. WOODRUFF & SONS, Milford, Conn. Sugar or Pie Pumpkin..... Crown Paint & Paper, Inc., North Adams	98 (R)	Aug.
<b>RADISH</b>			
D-510	JOSEPH BRECK & SONS, Boston, Mass. White Strassburg Radish..... Joseph Breck & Sons, Boston	79	Aug.
D-511	Saxa Radish..... Joseph Breck & Sons, Boston	81	Aug.
D-512	Round Black Spanish Radish..... Joseph Breck & Sons, Boston	91	Aug.
D-513	COMSTOCK, FERRE & CO., Wethersfield, Conn. Scarlet Globe Radish..... J. O. Neill Hardware Co., Fall River	88	Aug.
D-513	THOMAS W. EMERSON CO., Boston, Mass. French Breakfast Radish..... L. E. Smith Co., Gloucester	72 (R)	July
D-514	Scarlet Globe Radish..... W. G. Pearse & Co., Fall River	80	Aug.
D-514	FERRY-MORSE SEED CO., Detroit, Mich. Early Scarlet Turnip Radish..... P. R. Winters, Belmont	84 (R)	July
D-515	Early Scarlet Turnip Radish..... F. D. Bradshaw, South Sudbury	78	Aug.
D-516	Icicle Radish..... Sinclair Hardware Co., Medford	94	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
RADISH — Concluded			
D-315	FREDONIA SEED CO., Fredonia, N. Y. Early Scarlet Globe Radish..... D. L. Chamberlin, Carlisle Center	82	July
D-517	Early Scarlet Globe W. Tip Radish..... D. L. Chamberlin, Carlisle Center	95	Aug.
D-316	CHARLES C. HART SEED CO., Wethersfield, Conn. Early Scarlet Globe Radish..... Longmeadow Public Market, Longmeadow	70	July
D-317	French Breakfast Radish ..... C. F. Page & Co., Athol	72	July
D-318	BUDD D. HAWKINS, Reading, Vt. Early Scarlet White Tip Radish..... Derby Stores, Inc., Ashby	78	July
D-319	New French Breakfast Radish ..... J. J. Hanley, Marlboro	88	July
D-518	NORTHROP, KING & CO., Minneapolis, Minn. Early Scarlet Globe Radish..... Shattuck Stores Co., Groton	67	Aug.
D-320	JEROME B. RICE SEED CO., Cambridge, N. Y. Extra Early Scarlet Turnip Radish..... John Degano & Son, Granville	88	July
D-321	Early Scarlet Turnip White Tipped Radish..... W. A. & R. E. Thompson, Colrain	76 (R)	July
D-322	Extra Early Scarlet Turnip Radish..... Holstrom Bros., Auburn	85	July
D-323	Extra Early Scarlet Turnip Radish..... Pierce-Millbury Hardware Co., Millbury	90	July
D-519	Round Black Spanish Radish..... Boston Supply Inc., Framingham	76	Aug.
D-520	Vick's Early Scarlet Radish..... Fred E. Daisy, Carlisle Center	87	Aug.
D-521	ROSS BROS. CO., Worcester, Mass. Early Round Scarlet Radish..... L. E. Hawes, Sudbury	79	Aug.
D-324	F. H. WOODRUFF & SONS, Milford, Conn. French Breakfast Radish..... Haverhill Hardware & Plumbing Co., Haverhill	88	July
D-522	White Tip Radish..... Marlboro Hardware Co., Marlboro	75	Aug.
RUTABAGA			
D-384	F. H. WOODRUFF & SONS, Milford, Conn. Am. Purple Top Rutabaga..... Martin W. Dugan Co., Newburyport	94	July
SALSIFY			
D-325	FREDONIA SEED CO., Fredonia, N. Y. Vegetable Oyster Salsify..... G. Canovars, Kingston	35	Aug.
D-326	LAKE SHORE SEED CO., Dunkirk, N. Y. Salsify..... Lockhardt Hardware Co., Natick	33 (R)	Aug.
D-327	JEROME B. RICE SEED CO., Cambridge, N. Y. Vegetable Oyster Salsify..... C. A. Noyes & Co., Brockton	92	Aug.
D-328	Mammoth Sandwich Island Salsify ..... R. E. Faulkner, Palmer	85	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
SPINACH			
D-329	JOSEPH BRECK & SONS CORP., Boston, Mass. Bloomsdale Spinach..... A. H. Whidden Sons, Peabody	70	July
D-330	FERRY-MORSE SEED CO., Detroit, Mich. King of Denmark Spinach..... P. R. Winters, Belmont	70	July
D-523	Juliana Spinach..... Elwood Adams Inc., Worcester	75	Aug.
D-524	FREDONIA SEED CO., Fredonia, N. Y. Long Standing Spinach..... P. Welcome, Orange	41	Aug.
D-525	CHARLES C. HART, Wethersfield, Conn. Thick Leaf Spinach..... C. F. Page & Co., Athol	65	Aug.
D-331	NORTHRUP, KING & CO., Minneapolis, Minn. Round Thick Leaved Spinach..... Newton Corner Hardware Co., Newton	51	July
D-526	Bloomsdale or Savoy Leaved Spinach..... O. B. Parks Co., Westfield	51	Aug.
D-332	PAGE SEED CO., Greene, N. Y. Bloomsdale Spinach..... A. C. Stone Hardware Co., Brockton	48	July
D-527	JEROME B. RICE SEED CO., Cambridge, N. Y. Bloomsdale or Savoy Leaved Spinach..... Holstrom Bros., Auburn	70	Aug.
D-528	Round Thick Leaved Spinach..... Burlingame & Darbys Co., North Adams	40	Aug.
D-530	ROSS BROS. CO., Worcester, Mass. Early Giant Thick Leaved Spinach..... La Palme Hardware Co., Webster	70	Aug.
D-531	Savoy Virginia Yellow Resistant Spinach..... Ross Bros. Co., Worcester	77	Aug.
D-532	Bloomsdale Long Standing Spinach..... Ross Bros. Co., Worcester	85	Aug.
D-533	King of Denmark Spinach..... Ross Bros. Co., Worcester	70	Aug.
D-333	F. H. WOODRUFF & SONS, Milford, Conn. Reselected Savoy Spinach..... Frank, The Seedman, Springfield	80	July
D-535	Bloomsdale or Savoy Leaved Spinach..... Peirson Hardware Co., Pittsfield	60	Aug.
D-536	S. D. WOODRUFF & SONS, Orange, Conn. Long Standing Spinach..... Central Hardware Co., Fitchburg	73	Aug.
SQUASH			
D-535	JOSEPH BRECK & SONS CORP., Boston, Mass. Mammoth Warted Hubbard Squash..... C. B. Coburn & Co., Lowell	92	Aug.
D-537	Boston Greek Squash..... Joseph Breck & Sons, Boston	98	Aug.
D-538	Mammoth White Bush Squash..... Joseph Breck & Sons, Boston	45	Aug.
D-539	Delicious Squash..... Joseph Breck & Sons, Boston	92	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
SQUASH — Concluded			
D-543	COMSTOCK, FERRE & CO., Wethersfield, Conn. Summer Crookneck Squash..... Carlisle Hardware, Springfield	95	Aug.
D-336	THOMAS W. EMERSON CO., Boston, Mass. Boston Marrow Squash..... O'Brien Hardware Co., East Milton	89	Aug.
D-337	White Bush Scallop Squash..... Millis Coal & Grain Co., Millis	63 (R)	Aug.
D-542	Early Summer Crookneck Squash..... L. E. Smith Co., Gloucester	93	Aug.
D-338	FERRY-MORSE SEED CO., Detroit, Mich. Golden Hubbard Squash..... Norwood Hardware Supply Co., Norwood	84	Aug.
D-540	Table Queen or Des Moines Squash..... Sears, Roebuck & Co., Quincy	74	Aug.
D-544	D. LANDRETH SEED CO., Bristol, Pa. Blue Hubbard Squash..... Hampshire Hardware Co., Northampton	99	Aug.
D-340	LEONARD SEED CO., Chicago, Ill. Hubbard Squash..... F. W. Carson, Quincy	94	Aug.
D-341	NORTHRUP, KING & CO., Minneapolis, Minn. Italian Marrow Squash..... Sam's Auto Supply Co., Norwood	70 (R)	Aug.
D-541	Golden Summer Crookneck Squash..... Diamond Hardware Stores, East Milton	67	Aug.
D-342	PERRY SEED CO., Boston, Mass. Victor Squash..... Perry Seed Co., Boston	85	Aug.
D-343	Delicious Squash..... Perry Seed Co., Boston	87	Aug.
D-344	Early W. Bush Scalloped Squash..... Perry Seed Co., Boston	88	Aug.
D-345	Essex Hybrid Squash..... Perry Seed Co., Boston	58	Aug.
D-346	Boston Greek Squash..... Perry Seed Co., Boston	86	Aug.
D-348	JEROME B. RICE SEED CO., Cambridge, N. Y. Blue Hubbard Squash..... Thompson Hardware Co., Lowell	98	Aug.
D-349	F. H. WOODRUFF & SONS, Milford, Conn. Improved Hubbard Squash..... Schilling & Noble, Stockbridge	88	Aug.
D-350	Improved Hubbard Squash..... Haverhill Hardware & Plumbing Co., Haverhill	92	Aug.
D-351	Red or Golden Squash..... Frank, The Seedman, Springfield	95	Aug.
D-545	Boston Marrow Squash..... Crown Paint & Paper Co., North Adams	3	Aug.
SWISS CHARD			
D-352	JOSEPH BRECK & SONS, Boston, Mass. Swiss Chard..... A. H. Whidden & Son, Inc., Peabody	85	Aug.
D-353	CONTINENTAL NURSERIES, INC., Franklin, Mass. Lucullus Swiss Chard..... A. J. Cataldos Sons, Franklin	85	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>SWISS CHARD — Concluded</b>			
D-354	THOMAS W. EMERSON CO., Boston, Mass. Swiss Chard..... P. R. Winter, Belmont	76	Aug.
D-355	FREDONIA SEED CO., Fredonia, N. Y. Swiss Chard..... H. W. Jordan, Carver	77	Aug.
D-356	CHARLES C. HART SEED CO., Wethersfield, Conn. Dark Green Swiss Chard..... Longmeadow Public Market, Longmeadow	72	Aug.
D-357	NORTHRUP, KING & CO., Minneapolis, Minn. Swiss Chard..... H. J. Ford, Hanover	68	Aug.
D-358 (A)	Swiss Chard, or Spinach Beet..... Newton Corner Hardware Co., Newton	65	Aug.
D-358 (B)	PAGE SEED CO., Greene, N. Y. Swiss Chard, D-10-7434..... J. H. Fairbanks & Co., Bridgewater	66	Aug.
<b>TOMATO</b>			
D-359	JOSEPH BRECK & SONS CORP., Boston, Mass. Bonny Best Tomato..... C. G. McMullin, Newton	80	Aug.
D-360	Earliana Tomato..... John A. Geb, Franklin	48	Aug.
D-361	COMSTOCK, FERRE & CO., Wethersfield, Conn. Bonny Best Tomato..... Carlisle Hardware Co., Springfield	76 (R)	Aug.
D-362	FERRY-MORSE SEED CO., Detroit, Mich. Cooper's Special Tomato..... F. D. Bradshaw, South Sudbury	79	Aug.
D-363	Marglobe Tomato..... P. A. Winters, Belmont	82	Aug.
D-364	FREDONIA SEED CO., Fredonia, N. Y. Ponderosa or Beefsteak Tomato..... Clover Farm Stores, Grafton	70	Aug.
D-365	CHARLES C. HART SEED CO., Wethersfield, Conn. John Baer Tomato..... G. R. Norton, Otis	67	Aug.
D-366	BUDD D. HAWKINS, Reading, Vt. Budd's Selected Sparks Earliana Tomato..... W. T. Richards & Son, Erving	82	Aug.
D-367	LAKE SHORE SEED CO., Dunkirk, N. Y. Acme Tomato..... Bent's Hardware, Brighton	58	Aug.
D-368	New Stone Tomato..... Joe Niedbala, Hadley	50 (R)	Aug.
D-369	NORTHRUP, KING & CO., Minneapolis, Minn. Sparks Earliana Tomato..... Central Square Hardware Co., Cambridge	82	Aug.
D-370	JEROME B. RICE SEED CO., Cambridge, N. Y. The Stone Tomato..... Lockhart Hardware Co., Natick	92	Aug.
D-371	The Stone Tomato..... Central Square Hardware Co., Cambridge	85	Aug.
D-372	Marglobe Tomato..... And. F. Curtin Sons, Medford	92	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>TOMATO — Concluded</b>			
D-373	John Baer or Improved Chalk's Jewel Tomato..... Holstrom Bros., Auburn	86	Aug.
D-374	ROSS BROS. CO., Worcester, Mass. Dwarf Champion Tomato..... Newton Corner Hardware Co., Newton	88	Aug.
D-375	Dwarf Champion Tomato..... L. E. Howes, Sudbury	90	Aug.
D-376	John Baer Extra Early Tomato..... George G. Henry, Ashfield	92	Aug.
D-377	F. H. WOODRUFF & SONS, Milford, Conn. Stone Tomato..... Haverhill Hardware & Plumbing Co., Haverhill	96	Aug.
D-378	Chalk's Early Jewel Tomato..... J. B. Sibley & Son, Ware	70	Aug.
D-379	Pritchard Scarlet Top Tomato..... Frank, The Seedman, Springfield	96	Aug.
<b>TURNIP</b>			
D-380	THOMAS W. EMERSON CO., Boston, Mass. White Egg Turnip..... Millis Coal & Grain Co., Millis, Mass.	75	July
D-381	FERRY-MORSE SEED CO., Detroit, Mich. Purple Top White Globe Turnip..... Newton Corner Hardware Co., Newton	92	July
D-548	BUDD D. HAWKINS, Reading, Vt. Orange Jelly, or Golden Ball Turnip..... A. E. Stewart Estate, Athol	66	Aug.
D-549	New White Sweet German Turnip..... A. L. Johnson, Orange	97	Aug.
D-550	New White Sweet German Turnip..... F. J. Noel, Lancaster	49	Aug.
D-551	NORTHRUP, KING & CO., Minneapolis, Minn. Purple Top Strap Leaved Turnip..... Pierce-Millbury Hardware Co., Millbury	60	Aug.
D-382	PAGE SEED CO., Greene, N. Y. Purple Top Strap Leaf Turnip..... A. C. Stone Hardware Co., Brockton	71	July
D-552	JEROME B. RICE SEED CO., Cambridge, N. Y. Early Snowball Turnip..... Fitchburg Hardware Co., Fitchburg	80	Aug.
D-383	ROSS BROS., Worcester, Mass. Yellow Globe Turnip..... C. W. Robinson, Brimfield	65	July
D-553	White Egg Turnip..... The La Palme Hardware, Webster	62	Aug.
D-554	White Egg Turnip..... E. H. Howe & Son, Enfield	87	Aug.
D-555	STERLING SEED CO., Minneapolis, Minn. Purple Top White Globe Turnip..... H. L. Green, Webster	56	Aug.
D-556	F. H. WOODRUFF & SONS, Milford, Conn. Yellow Amber Turnip..... H. R. Durant, Belchertown	96	Aug.

## 1934 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Concluded

## VEGETABLES — Concluded

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1934 Month of Test
<b>TURNIP — Concluded</b>			
D-385	S. D. WOODRUFF & SONS, Orange, Conn. White Globe Turnip..... Danvers Hardware Co., Danvers	88	July
D-557	Aberdeen Purple Top Yellow Turnip..... Central Hardware Co., Fitchburg	97	Aug.

## WATERMELON

D-339	FREDONIA SEED CO., Fredonia, N. Y. Kleckley's Sweet Watermelon..... H. W. Jordan, Carver	71	Aug.
D-230	F. H. WOODRUFF & SONS, Milford, Conn. Kleckley's Sweet Watermelon..... W. C. Ring, Palmer	57	Aug.

## Laboratory and Field Germination Tests of Sweet Corn

Seed Laboratory, Departments of Botany and Vegetable Gardening Cooperating

The following summary marks the end of three successive years' work, during which comparative laboratory and field tests of sweet corn have been conducted in an endeavor to find the effect of various seed-borne organisms on germination.

The purpose of the germination tests and the methods followed throughout were essentially the same as those described for 1933. This year, however, in addition to the laboratory and field germination work, a seed treatment test was conducted. Several lots of seed that showed pronounced contamination or infection by common seed-borne fungi in the laboratory germinator, as well as a few comparatively disease-free lots, were included in order to determine the effect of two common seed disinfectants upon normal germination in the field. The Seed Laboratory had direct charge of the germination work in the laboratory; the Vegetable Gardening Department supervised planting of the field tests; and O. C. Boyd, Extension Plant Pathologist, made disease readings with interpretations in all three tests.

The laboratory germinations were run during April and May, and the field plantings were made in June. The field tests were located on moderately heavy, well-drained soil, and weather and soil conditions were considered very favorable for germination and subsequent growth of plants.

This year 196 lots or sources of seed, representing 83 varieties, were germinated in the laboratory; and 175 of the corresponding lots in the field. A summary of the results, together with interpretations is given below. A more detailed discussion of the results for the three year's project will appear at a later date in another publication.

1. Germination in the laboratory (average of all lots):	<i>Per Cent</i>
a. Total germination (range of 66.5-100).....	92.6
b. Abnormal due to seedling infection (0-56).....	17.5
c. Abnormal due to other causes (0-8).....	0.9
d. Normal germination (33-99) .....	74.2
2. Germination in the field (average of all lots):	
a. Total emergence (range of 23.5-99.5).....	79.4
b. Abnormal plants (only stunted plants were pulled and examined):	
(1) With infected mesocotyl or root (0-27).....	10.9
(2) Not diseased; undersized only (0-6).....	0.9
c. Normal germination (18.5-97.5).....	67.6

In general the results were similar to those for 1933. Again the average total emergence in the field test fell far below the average total germination in the laboratory, but was only slightly higher (5.2%) than the average *normal* germination in the laboratory series. Perhaps the most outstanding difference between the above summary and the one for 1933 is the higher percentage of abnormal seedlings this year in both the laboratory germinators and the field planting. Seed-lot contamination and seedling infection by *Rhizopus* and *Penicillium* in particular, as well as kernel decay and seedling infection by *Diplodia*, were more noticeable in the laboratory test this year than in 1933. It may be that weather conditions prior to and during harvest of the seed were particularly favorable for contamination and infection by those fungi.



It will be noted that in spite of the fact that every seedling in the germinator that showed a primary disease lesion on root or shoot was pronounced abnormal, the total of which averaged 17.5 per cent, yet the average percentage of normal germination in the laboratory series remained considerably above that for the field germination test; 7.6 per cent higher. This perhaps might be explained in part by the greater depressing effect of both the seed-borne diseases and the otherwise weak seedlings on total emergence and normal germination in the field planting than in the laboratory where conditions for germination are more suitable; and in part by the additional depressing effect on field germination of soil-inhabiting parasites.

#### Effects of Molds and Other Seed-Borne Fungi on Germination

Some of the more common seed-borne fungi were observed to have a marked effect on germination in both the laboratory and the field. In considering groups of seed-lots that were affected by some one outstanding disease in the germinators, *Diplodia* appeared to cause the greatest reduction in normal germination in the laboratory test, with *Rhizopus*, *Penicillium*, and *Fusarium* (and *Gibberella*) ranking next in order of importance. In the field, however, *Rhizopus* was the most important single factor in reducing both the total emergence and normal germination, with *Penicillium*, *Diplodia*, and *Fusarium* (and *Gibberella*) following in the order indicated. The following table indicates the comparative effect on germination of those seed-borne fungi:

Outstanding Diseases in Laboratory Germinator	Number of Lots	Average germination in Laboratory		Average germination in Field	
		Total	Normal	Total	Normal
		<i>Per Cent</i>	<i>Per Cent</i>	<i>Per Cent</i>	<i>Per Cent</i>
None; all diseases light.....	39	95.3	86.0	88.4	79.1
<i>Diplodia</i> .....	23	92.2	70.6	81.2	69.8
<i>Rhizopus</i> .....	34	94.0	73.0	74.2	60.8
<i>Penicillium</i> .....	11	93.8	75.6	79.2	66.6
<i>Fusarium</i> (and <i>Gibberella</i> ).....	24	93.1	77.3	83.1	71.9

Since many more seed-lots were severely affected by the two molds (*Rhizopus* and *Penicillium*) than by *Diplodia* or other seed-borne disease fungi, they constituted in the aggregate by far the greatest depressing factors on germination, especially in the field. Other seed-borne fungi, such as *Alternaria*, *Basidiosporium*, *Hormodendron*, and *Cephalosporium*, were observed commonly in the laboratory germinator, causing dead kernels or weak seedlings, but were less important than the organisms mentioned in the preceding paragraph.

#### Effect of Seed Treatment on Germination in the Field

Following the laboratory germination test, 35 seed-lots were selected for the presence of particular seed-borne diseases, and 10 for relative freedom from diseases. Each lot was divided into three series, one of which was treated in mercuric chloride for 10 minutes, one dusted with ethyl mercury phosphate (Semesan Jr.), and the other left untreated for a check. The seeds were planted in June in rows 36 inches apart, 4 inches apart in the row, and were covered by hand. The three series of a lot were planted side by side in adjacent rows, with the untreated one in the middle. The corresponding series of a second lot followed in the same rows with a short interval between lots; and so on, with 7 lots end to end in each three-row group. The effect of the treatments is summarized as follows:

1. Kind of diseases represented:	<i>Number of Lots</i>
a. Free from seed-borne diseases.....	10
b. Heavy Rhizopus contamination.....	6
c. Heavy Penicillium contamination.....	6
d. Both Rhizopus and Penicillium.....	10
e. Pronounced Diplodia infection.....	7
f. Pronounced pink-kernel discolorations by Fusarium and Gibberella.....	6
2. Effect of treatments on normal germination:	
a. Increased germination from both treatments.....	19
b. Benefit from the liquid treatment only.....	4
c. Benefit from the dust treatment only.....	4
d. Reduced germination (injury) from both treatments.....	2
e. Injured by the liquid treatment only.....	2
f. Injured by the dust treatment only.....	1
g. No appreciable benefit or injury from either treatment.....	13
3. Extent of improvement in normal germination due to the treatments:	
Mercuric chloride, 4 to 20 %, with an average of 10.5 %	
Semesan Jr., 4 to 23 %, with an average of 11.1 %.	
4. Response of individual diseases to the treatments:	
a. The 22 lots contaminated with Rhizopus and (or) Penicillium:	
Benefited by both treatments.....	15
Benefited by one treatment or the other.....	3
No apparent effect shown.....	4
b. The 10 disease-free lots:	
Benefited by both treatments.....	1
Benefited by the mercuric chloride treatment.....	1
Injured by both treatments.....	1
Showed no benefit or injury.....	7
c. The 6 lots heavily discolored by Fusarium:	
Benefited by the treatments.....	4
Not benefited by the treatments.....	2
d. The 7 lots noticeably infected by Diplodia:	
Increased germination from the treatments.....	4
No apparent effect from the treatments.....	3

It appears that increased germination from both treatments was most consistent among the seed-lots that showed marked contamination or infection by Rhizopus and Penicillium. The mercuric chloride treatment appeared to be slightly more effective against these two molds than the organic mercury dust; the Semesan Jr. dust treatment, more effective against Diplodia and Fusarium; while neither treatment proved beneficial to a majority of the disease-free lots.

It seems evident from the observations made in the 1934 sweet corn germination work that seed-borne diseases may affect appreciably the normal germination in both the laboratory and the field, showing a greater depressing effect in the field; and that seed treatment with mercuric chloride or organic mercury will considerably increase normal germination in the field in a majority of the more heavily diseased lots. Common molds, such as species of Rhizopus and Penicillium, are likely to be greater sources of injury to germination in the field than other kinds of seed-borne disease organisms because of their unquestionable pathogenicity and their usually greater abundance in seed corn. These molds, however, respond very well to seed treatment.

It is believed that if seedlings in the laboratory germinator that show infection by organisms arising from the particular kernels concerned are considered abnormal, then the normal germination readings in the laboratory can be expected to represent a fair index of the germinating ability of the corresponding lots in the field. If the seedling diseases are not taken into account in the laboratory counts, the total emergence and normal germination in the field are likely to be considerably lower than might be expected from the laboratory readings.

### Type and Variety Studies of Sweet Corn

Conducted in Conjunction with the Department of Vegetable Gardening  
Grant B. Snyder

The field trials of sweet corn for 1934 included 300 lots, consisting of 125 different named sorts from 90 sources. The seed was obtained in all cases from the seed firm or grower. In conducting the trials every effort was made to maintain as uniform conditions as possible and to evaluate the plant and ear characteristics on a fair basis. Detailed records were taken of each lot as to plant, ear, and kernel characters as well as maturity periods. Kernel toughness was also studied for a few of the more important commercial sorts.

In general the sorts included were true in type for the variety designated by the seedsman.

Golden Gem by S. D. Woodruff resembled Spanish Golden as in the trials of 1933.

Golden Sunshine was divided into two rather definite groups. The strains from Alex. Forbes Seed Co., Joseph Breck & Sons Corp., Hart Seed Co., S. D. Woodruff & Sons, and F. H. Woodruff & Sons bore ears resembling Golden Early Market somewhat more than original Sunshine. The variation, however, was not sufficient to prevent their inclusion within the variety range for Golden Sunshine.

Golden Bantam strains were uniformly eight-rowed, and any lots of Golden Bantam type having more than eight rows were generally designated as different from true Golden Bantam by the seedsman.

Hybrid Sweet Corns, which were first produced for their resistance to Stewart's disease, performed well, all of the named sorts being high yielding and very uniform, with Top Cross Bantam, Golden Cross Bantam, and Red Green of excellent eating quality. Some of the unnamed sorts in the trials have since been named, and it would appear that even in years when Stewart's disease is not serious, hybrid sweet corns will be of considerable importance due to their uniformity of ear characters and high yielding ability.

### Type and Variety Studies of Vegetables

Conducted in Conjunction with the Department of Vegetable Gardening  
Grant B. Snyder

Most small home gardeners buy their vegetable seeds from the neighborhood store in packet or bulk lots. They find that in a fair percentage of cases seed purchased from such sources are quite variable in germination and the resulting plants are variable in type and performance. With this in mind the Department of Vegetable Gardening cooperated with the Seed Laboratory in checking packet and bulk seed stock which was purchased on the open market from various sources by state inspectors.

Specifically, the project was undertaken to check the various lots on trueness to name and actual performance in the field. The sorts planted in the field trials included 139 lots of the following vegetables: beans, beets, carrots, cucumbers, lettuce, onions, parsnips, radish, spinach, squash, and turnips.

In general, the various sorts ran fairly true to the name printed on the seed packet. The carrots were very much off type, and there were some misnamed in the lettuce and spinach lots.

Lot No.	Variety and Source	Remarks	
BEANS			
1	Early Red Valentine..... CROSSMAN SEED CO. S. S. Kresge Co., Northampton	True to name, performance satisfactory	
2	Pencil Pod Black Wax..... CROSSMAN SEED CO. S. S. Kresge Co., Northampton		
3	Early Red Valentine..... FREDONIA SEED CO. A. H. Phillips, Belchertown		
4	Black Butter..... JEROME B. RICE O. B. Parks Co., Westfield		
5	Golden Wax..... JEROME B. RICE T. F. Ayers, Shrewsbury		
6	Burpee Stringless Green Pod..... JEROME B. RICE Harry E. Bingham, Hardwick		
7	Early Stringless Green Pod..... STERLING SEED CO. H. L. Green, Webster		
8	Black Wax..... THOMAS W. EMERSON CO. H. A. Spear & Son		
9	White Marrow..... THOMAS W. EMERSON CO. O. B. Parks Co., Westfield		
10	Kentucky Wonder..... JOSEPH BRECK & SONS E. E. Bickford & Co., Hingham		
11	Pencil Pod Black Wax..... PAGE SEED CO., C. R. Ripley, Blandford		
12	Scarlet Runner..... JEROME B. RICE SEED CO. Pierce Hardware Co., Taunton		
13	French Dwarf Hort..... F. H. WOODRUFF & SONS Thompson Hardware, Lowell		
BEETS			
14	Dewing Early Blood..... JOSEPH BRECK & SONS Farm Service Stores, W. Berlin	True to name, performance satisfactory	
15	Crosby Egyptian..... THOMAS W. EMERSON CO., P. R. Winters, Belmont		
16	Edmond's Imp. Blood..... THOMAS W. EMERSON CO. P. R. Winters, Belmont		
17	Early Eclipse..... FREDONIA SEED CO. Clover Farms Stores, Grafton		
18	Early Blood..... FREDONIA SEED CO. Mongeon & Lynch, Auburn		
20	Extra Early Egyptian..... NORTHROP, KING & CO. O. P. Parks, Co., Westfield		
21	Early Wonder..... PAGE SEED CO. Harry E. Bingham, Hardwick		
22	Early Egyptian..... JEROME B. RICE Payne-Cummings Hdwe. Co., N. Adams		
23	Early Eclipse..... JEROME B. RICE Burlingame & Darbys Co., N. Adams		
24	Crosby's Egyptian..... ROSS BROS. La Palme Hardware, Webster		
25	Early Wonder..... ROSS BROS. Ross Bros., Worcester		
26	Detroit Dark Red..... F. H. WOODRUFF & SONS Crown Paint & Paper Co., N. Adams		A mangel, not a table beet
27	Large Red Mammoth..... F. H. WOODRUFF & SONS Peirson Hdwe. Co., Pittsfield		True to name, performance satisfactory
28	Early Blood Turnip..... S. D. WOODRUFF & SONS Central Hdwe. Co., Fitchburg		

Lot No.	Variety and Source	Remarks
<b>CARROTS</b>		
43	Long Orange..... JOSEPH BRECK & SONS Flotos Hdwe., Inc., Brighton	65 true to name, 9 other var.
44	Early Scarlet Forcing..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	True to name, excellent.
45	Early Scarlet Horn..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	3 true to name, 63 other var.
46	Long White Belgian..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	65 true to name, 10 other var.
47	Oxheart..... JOSEPH BRECK & SONS Franklin D. Williams, Taunton	51 true to name, 65 other var.
48	Short Horn..... COMSTOCK, FERRE & CO. J. O. Neill Hdwe., Fall River	A mixture of Oxheart and Chantenay
49	Imp. Long Orange..... THOMAS W. EMERSON CO. J. O. Neill Hdwe., Fall River	46 true to name, 18 off
50	Chantenay..... D. M. FERRY & CO. Flotos Hdwe., Inc., Brighton	37 true to name, 22 other var.
51	Oxheart..... FREDONIA SEED CO. Wright & Fletcher, Westford	Uniformly Chantenay type
52	Danvers H. Long..... LAKE SHORE SEED CO. C. A. Gifford Estate, Westport	27 Danvers H. Long, 6 Oxheart
53	Early Scarlet Horn..... PERRY SEED CO. Perry Seed Co., Boston	} True to name
54	Nante's H. Long..... PERRY SEED CO. Perry Seed Co., Boston	
55	Pride of Denmark..... PERRY SEED CO. Perry Seed Co., Boston	
		55 true to name, 33 other var.

**CUCUMBERS**

76	Klondike..... JOSEPH BRECK & SONS CORP. Joseph Breck & Sons Corp., Boston	} True to name
77	Sunny South..... JOSEPH BRECK & SONS CORP. Joseph Breck & Sons Corp., Boston	
78	Early Fortune..... COMSTOCK, FERRE & CO. Jose J. D'Arruda, Fall River	
80	Early Short Green..... FERRY-MORSE SEED CO. Henry Duncan Corp., Winchester	
81	Davis Perfect..... PAGE SEED CO. Arthur E. Wills, Medfield	
82	Improved Long Green..... THOMAS W. EMERSON CO. Orange Hardware, Orange	
83	Davis Perfect..... LEONARD SEED CO. Hamilton & Atwater, Westfield	
84	Long Green..... JEROME B. RICE CO. Danaher Hdwe. Co., Williamstown	
85	Woodruff's Hybrid..... F. H. WOODRUFF & SONS Haverhill Hdwe. & Plumbing, Haverhill	
86	Early White Spine..... JEROME B. RICE And. F. Curtin & Sons, Medford	

Lot No.	Variety and Source	Remarks
<b>LETTUCE</b>		
87	New York..... JOSEPH BRECK & SONS C. G. McMullin, Newton	True to name, headed poorly
88	Early Curly Simpson..... THOMAS W. EMERSON CO. C. G. McMullin, Newton	
89	Big Boston..... FERRY-MORSE SEED CO. Frank W. Richardson, Waltham	True to name
90	G. S. Simpson..... FERRY-MORSE SEED CO. Frank W. Richardson, Waltham	
91	Romaine..... CHARLES C. HART SEED CO. Waverly Hdwe. Co., West Newton	Very open and dwarf
92	New York Special..... NORTHROP, KING & CO. Newton Corner Hdwe. Co., Newton	True to name
93	Romaine..... PAGE SEED CO. Henry L. Sawyer, Framingham	Paris White Cos
94	Iceberg..... PAGE SEED CO. Henry L. Sawyer, Framingham	New York, not Iceberg
95	B. S. Tennis ball..... PAGE SEED CO. Henry L. Sawyer, Framingham	True to name
96	Boston Curled..... JEROME B. RICE Arthur C. Lamson, Inc., Marlboro	True to name, bolted prematurely
97	Hanson..... JEROME B. RICE Arthur C. Lamson, Inc., Marlboro	True to name
98	Big Boston..... ROSS BROS. CO. Newton Corner Hdwe., Newton	
99	Romaine..... F. H. WOODRUFF & SONS Boston Supply Inc., Framingham	
100	Big Boston..... F. H. WOODRUFF & SONS Boston Supply Inc., Framingham	

**ONIONS**

101	Prize taker..... COMSTOCK, FERRE & CO. Carlisle Hdwe. Co., Springfield	True to name
102	Bunching..... CROSSMAN SEED CO. S. S. Kresge Co., Northampton	
103	Y. G. Danvers..... THOMAS W. EMERSON CO. Waite Hdwe. Co., Webster	
104	Sweet Spanish..... FERRY-MORSE SEED CO. Elwood Adams, Inc., Worcester	
105	Y. G. Danvers..... CHARLES C. HART SEED CO. Fitchburg Hdwe. Co., Fitchburg	Yellow Globe Danvers
106	Large Red Wethersfield..... BUDD D. HAWKINS A. E. Stewart Estate, Athol	
107	Yellow Globe..... LEONARD SEED CO. Hamilton & Atwater, Westfield	True to name
108	White Portugal..... JEROME B. RICE Pierce-Millbury Hdwe. Co., Millbury	
109	Prizetaker..... ROSS BROS. CO. Ross Bros. Co., Worcester	
110	Southport Red G. V. C..... ROSS BROS. CO. Ross Bros. Co., Worcester	
111	Large Red Globe..... F. H. WOODRUFF & SONS Peirson Hdwe. Co., Pittsfield	Failed to germinate
112	White Globe..... F. H. WOODRUFF & SONS Berkshire Hdwe. Co., Pittsfield	

Lot No.	Variety and Source	Remarks
ONIONS — Concluded		
113	Southport Globe..... F. H. WOODRUFF & SONS Crown Paint & Paper Co., N. Adams	True to name
114	Red Wethersfield..... F. H. WOODRUFF & SONS Frank, The Seedman, Springfield	
115	Y. G. Danvers..... S. D. WOODRUFF & SONS Central Hdwe. Co., Fitchburg	
PARSNIP		
128	Hollow Crown..... JOSEPH BRECK & SONS Franklin D. Williams, Taunton	True to name
130	Hollow Crown..... FREDONIA SEED CO. Wright & Fletcher, Westford	
131	Hollow Crown..... LAKE SHORE SEED CO. C. A. Gifford Estate, Westport	
132	Gurnsey..... NORTHRUP, KING & CO. Sam's Auto Supply Co., Norwood	True for Hollow Crown
134	Long White Dutch Hollow..... JEROME B. RICE SEED CO. Boston Supply Inc., Framingham	
RADISH		
135	White Strasburg..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	True to name
136	Saxa..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	True to name, tops large as Scarlet Globe
137	Round Black Spanish..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	True to name
138	Scarlet Globe..... COMSTOCK, FERRE & CO. J. O. Neill Hdwe. Co., Fall River	True to name, roots tend to be elongated.
139	Scarlet Globe..... THOMAS W. EMERSON CO. W. G. Pearse & Co., Fall River	True to name
140	Early Scarlet Turnip..... FERRY-MORSE SEED CO. F. D. Bradshaw, South Sudbury	
141	Icicle..... FERRY-MORSE SEED CO. Sinclair Hdwe. Co., Medford	
142	Early Scarlet Globe White Tip..... FREDONIA SEED CO. D. L. Chamberlin, Carlisle Center	True to name, but roots very variable in color
143	New French Breakfast..... BUDD D. HAWKINS J. J. Hanley's Hdwe. Co., Marlboro	True to name
144	Early Scarlet Globe..... NORTHRUP, KING & CO. Shattuck Stores Co., Groton	
145	Round Black Spanish..... JEROME B. RICE SEED CO. Boston Supply Inc., Framingham	
146	Vick's Early Scarlet Globe..... JEROME B. RICE SEED CO. Fred E. Daisy, Carlisle Center	
147	Early Round Scarlet..... ROSS BROS. CO. L. E. Hawes, Sudbury	
148	White Tip..... F. H. WOODRUFF & SONS Marlboro Hdwe. Co., Marlboro	
RUTABAGA		
178	New White Sweet German..... BUDD D. HAWKINS A. L. Johnson, Orange	True to name
179	New White Sweet German..... BUDD D. HAWKINS F. J. Noel, Lancaster	
187	Aberdeen Purple Top Yellow..... S. D. WOODRUFF & SONS Central Hardware Co., Fitchburg	



Lot No.	Variety and Source	Remarks
<b>SPINACH</b>		
149	Juliana..... FERRY-MORSE SEED CO. Elwood Adams Inc., Worcester	True to name
150	Long Standing..... FREDONIA SEED CO., P. Welcome, Orange	True to name, color light green
151	Thick Leaf..... CHARLES C. HART C. F. Page & Co., Athol	True to name
152	Bloomsdale..... NORTHROP, KING & CO. O. B. Parks Co., Westfield	
153	Bloomsdale..... JEROME B. RICE SEED CO. Holstrom Bros., Auburn	
154	Round Thick Leaf..... JEROME B. RICE SEED CO. Burlingame & Darbys Co., N. Adams	A very poor strain, bolting to seed very quickly
155	Prickly..... JEROME B. RICE SEED CO. Frank Howard Inc., Pittsfield	True to name
156	King of Denmark..... JEROME B. RICE SEED CO. Frank Howard Inc., Pittsfield	
157	Early Giant Thick Leaf..... ROSS BROS. CO. LaPalme Hdwe. Co., Webster	
158	Virginia Savoy..... ROSS BROS. CO. Ross Bros. Co., Worcester	A poor strain of Thick Leaf
159	Bloomsdale..... ROSS BROS. CO. Ross Bros. Co., Worcester	True to name
160	King of Denmark..... ROSS BROS. CO. Ross Bros., Co., Worcester	
161	Victoria..... F. H. WOODRUFF & SONS Schilling & Noble, Stockbridge	
162	Bloomsdale..... F. H. WOODRUFF & SONS Peirson Hdwe. Co., Pittsfield	True to name, bolted quickly
163	Long Standing..... S. D. WOODRUFF & SONS Central Hardware Co., Fitchburg	

**SQUASH**

164	Boston Greek..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	True to name
165	Mammoth White Bush..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	
166	Delicious..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	
167	Golden Hubbard..... JOSEPH BRECK & SONS Joseph Breck & Sons, Boston	
168	Golden Summer Crookneck..... FERRY-MORSE SEED CO. Sears, Roebuck & Co., Quincy	
169	Golden Summer Crookneck..... NORTHROP, KING CO. Diamond Hdwe. Stores, E. Milton	½ plants straightneck
170	Early Summer Crookneck..... THOMAS W. EMERSON CO. L. E. Smith Co., Gloucester	True to name
171	Summer Crook..... COMSTOCK, FERRE & CO. Carlisle Hdwe., Springfield	A good strain of straightneck
172	Blue Hubbard..... D. LANDRETH SEED CO. Hampshire Hdwe. Co., Northampton	True to name
173	Boston Marrow..... F. H. WOODRUFF & SONS Crown Paint & Paper Co., N. Adams	Failed to germinate



Lot No.	Variety and Source	Remarks
<b>TURNIPS</b>		
176	Red Globe..... CHARLES C. HART SEED CO. Fitchburg Hdwe. Co., Fitchburg	Red Top White Globe
177	Golden Ball..... BUDD D. HAWKINS A. E. Stewart Estate, Athol	Roots did not mature
180	Purple Top Strap Leaf..... NORTHRUP, KING & CO. Pierce-Millbury Hdwe. Co., Millbury	True to name
181	Early Snowball..... JEROME B. RICE SEED CO. Fitchburg Hdwe. Co., Fitchburg	
182	White Egg..... ROSS BROS. CO. The LaPalme Hdwe. Co., Webster	
183	White Egg..... ROSS BROS. CO. E. H. Howe & Son, Enfield	
184	Purple Top White Globe..... STERLING SEED CO. H. L. Green, Webster	
185	Yellow Amber..... F. H. WOODRUFF & SONS H. R. Durant, Belchertown	

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MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN NO. 78

JULY, 1935

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**Fifteenth Annual Report on  
Eradication of Pullorum Disease  
in Massachusetts**

By the Poultry Disease Control Laboratory

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The purpose of this bulletin is to report the results of pullorum-disease testing for the 1934-35 season. In the discussion of the results it is pointed out that progress is being made in the eradication of the disease as revealed by increases in the number of tested birds and tested samples of which only 0.39 percent were positive. The average percentage of positive tests is the lowest attained during the fifteen-year testing period. Salient factors which play a part in successful eradication are emphasized.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.

# FIFTEENTH ANNUAL REPORT ON PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1934-1935

By the Poultry Disease Control Laboratory<sup>1</sup>

## INTRODUCTION

Pullorum-disease testing has been carried on for Massachusetts poultrymen for the past fifteen years. During this period marked progress has been made in eradicating the disease from flocks. This outstanding accomplishment has greatly benefited the poultry industry, and it is the result of employing a reliable and efficient testing method together with sound and effective eradication and preventive measures, through the splendid cooperation of flock owners. As the pullorum-disease testing is continued, the benefit to the Massachusetts poultry industry will become progressively greater. It is seemingly evident that with an expansion in testing and an increase in the number of pullorum-disease-free breeding flocks, the losses from pullorum disease will be reduced to a minimum.

### *Summary of Service Rendered*

Applications received . . . . .	252
Applications cancelled . . . . .	5
Flocks tested . . . . .	247*
Number of tests . . . . .	302,237
Chickens:	
Routine . . . . .	289,464
Experimental . . . . .	12,423
Fowl other than chickens:	
Routine . . . . .	137
Experimental . . . . .	213
Owners receiving necropsy service . . . . .	29
Necropsies of reacting birds . . . . .	74

\*Includes three flocks of poultry other than chickens.

### Distribution of Tests and Reactors

Table 1 shows the distribution of tests and reactors by counties and breeds. A total of 301,887 samples received from 12 counties was tested. The percentage of positive samples was 0.39, the lowest ever attained during the 15-year testing period. No reactors were detected among birds tested in Barnstable, Plymouth and Suffolk Counties. Only three reactors were detected among 57,622 samples tested for Norfolk County, revealing a percentage of positive tests of 0.005. In every county the percentage of positive tests was less than one. Norfolk, Middlesex and Bristol lead in the number of tested samples. No reactors were detected among the 10,610 samples collected from White Plymouth Rocks and the 2,042 samples collected from White Wyandottes.

<sup>1</sup>Poultry Disease Control Laboratory Staff:—H. Van Roekel, Chief of Laboratory; K. L. Bullis, Assistant Veterinary Pathologist; O. S. Flint, Assistant Research Professor; Miriam K. Clarke and Felicia Zimnoski, Laboratory Assistants. Appreciation is extended to Dr. J. B. Lentz for assistance given to the testing work.

TABLE 1.--DISTRIBUTION OF TESTS AND REACTORS, BY COUNTIES AND BY BREEDS

Breed	Barnstable	Berkshire	Bristol	Essex	Franklin	Hamden	Hampshire	Middlesex	Norfolk	Plymouth	Suffolk	Worcester	Totals	Percent Positive Tests
(Total tests	2,169	2,659	37,652	12,344	18,905	14,134	16,451	46,206	51,867	14,078	597	40,117	257,209	
Rhode Island Reds.....(Positive tests	0	15	266	31	165	47	75	241	3	0	0	133	1,006	0.39
(Total tests	273		1,803	460	742	186	1,640	8,037	2,056	4,633		704	20,534	
Barred Plymouth Rocks (Positive tests	0		43	0	11	11	75	2	0	0		0	142	0.69
(Total tests			619	138			11	2,170	772	6,222		678	10,610	
White Plymouth Rocks (Positive tests			0	0			0	0	0	0		0	0	0.00
(Total tests		3,965	3,648	679		401	148	28	1,492			984	11,345	
White Leghorns.....(Positive tests		21	0	0		3	0	0	0			7	31	0.27
(Total tests							39	544	1,435	24			2,042	
White Wyandottes.....(Positive tests							0	0	0	0			0	0.00
(Total tests		11	85				51						147	
Miscellaneous.....(Positive tests		3	6				0						3	2.04
Total Tests.....	2,442	6,635	43,807	13,621	19,647	14,721	18,340	56,985	57,622	24,957	597	42,513	301,887	
(Number	0	39	339	31	176	61	150	243	3	0	0	140	1,182	
Positive Tests.....(Percent	0.00	0.59	0.77	0.23	0.90	0.41	0.82	0.43	0.005	0.00	0.00	0.33		0.39

## ANNUAL TESTING EFFECTIVE IN ERADICATION

Table 2 shows that 244 flocks were tested, representing 281,124 tested birds. Of this total, 37 flocks were tested for the first time, representing 19,474 birds and 22,790 tests, of which 2.17 percent were positive. The percentage of positive tests in this group was the highest among the four groups of tested flocks. However, it is encouraging that 27 of the flocks were non-reacting, which shows that among flocks tested for the first time, the incidence of pullorum disease is becoming less as the result of dissemination of pullorum-disease-clean stock.

In the intermittent-testing group, 18 flocks were tested, representing 11,315 birds, which revealed 0.41 percent reactors. In this group 14 non-reacting flocks were detected. Some of these flocks were established through the purchase of stock from pullorum-disease-clean sources, while in others their owners were successful in preventing the introduction of infection. The infection in the four positive flocks is attributed to faulty practices in disease eradication and prevention.

In the group tested for three or more consecutive years, 247,087 samples were tested, representing 161 flocks of which 149 were non-reacting and 12 were infected. The percentage of positive tests was 0.18, the lowest ever attained for this group during the testing history. It is clearly evident that continuous testing is successful in establishing and maintaining flocks free from the disease. It is reasonable to assume that all flocks which have been tested for three or more consecutive years will in the near future qualify for the negative group at the end of each testing season.

The average percentage of infection among the 244 tested flocks was 0.39. The total number of positive tests was 1,182, as compared with 1,512 in the 1933-34 season. This is a substantial decrease in the number of positive tests which is further evidence that progress is being made on eradication. The total number of non-reacting flocks was 213, of which 163 were 100 percent tested.

The percentage of flock owners who tested all the birds on the premises has increased from 66.8 in 1933-34 to 74.5 in 1934-35. The soundness of testing all birds on the premises cannot be ignored because the exact status of a flock cannot be determined with any degree of certainty by testing only part of the birds.

TABLE 2.--ANNUAL TESTING VERSUS SINGLE AND INTERMITTENT TESTING

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Per Cent	100% Tested	Partially Tested	100% Tested	Partially Tested
Tested for the first time.....	37	19,474	22,790	494	2.17	18	9	5	5
Intermittent testing.....	18	11,315	11,315	46	0.41	9	5	3	1
Two consecutive years.....	28	20,400	20,695	205	0.99	18	5	2	3
Three or more consecutive years..	161	229,935	247,087	437	0.18	118	31	9	3
Totals.....	244	281,124	301,887	1,182	0.39	163	50	19	21

# APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

In Table 3 are listed nine flocks which were negative in 1933-34, and revealed infection in 1934-35. The source of the infection was accounted for in four flocks as originating from custom-hatching or purchase of questionable stock. In five flocks the origin of infection remained obscure. In the majority of "breaks" the flocks possessed only a short non-reacting testing history (one or two years). In three flocks the infection was completely eliminated through intensive re-testing. While the number of "breaks" is small, it reveals that non-reacting flocks can become re-infected; hence the need for annual testing becomes apparent. Also the importance of effective preventive measures should not be ignored by the flock owner. The re-introduction of infection has involved additional expense through retesting, as well as from other points of view. The flock owner should be continually on his guard against infection which may enter through various channels. In this manner it will be possible to reduce the number of "breaks" to a minimum.

TABLE 3.--APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

Flock	Number of Years Negative	1934-35 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	4	{ 2,312 2,239	2,311 *823	{ 0.61 0.49	No information
2	2	{ 1,053 1,052 751 899	615 *438 *750 *894	{ 3.74 4.79 0.80 0.00	
3	1	{ 605 523 419	605 *522 *419	{ 3.47 1.72 0.24	No information
4	1	497	496	4.43	
5	2	1,152	1,151	0.17	Unsatisfactory
6	1	397	397	0.50	Custom hatching
7	5	4,231	4,230	0.38	Unsatisfactory
8	6	{ 2,080 1,928 1,905 1,768 1,679	2,079 *1,826 *1,455 *1,765 *1,679	{ 3.17 1.15 0.00 0.00 0.00	Unsatisfactory
9	1	{ 667 611 611	615 *46 *45	{ 0.33 0.00 0.00	

\*Represents retests.



# NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

Table 4 shows that in 12 counties a total of 213 non-reacting flocks, representing 251,778 birds, were established at the close of the testing season. At the end of the season 31 infected flocks, representing 29,346 birds, were credited to 8 counties. No reactors were detected among tested flocks in Barnstable, Plymouth and Suffolk Counties. Middlesex, Bristol and Worcester Counties led in the number of non-reacting flocks, while Norfolk, Middlesex and Worcester Counties had the largest number of birds in non-reacting flocks. Of the total birds tested 89.5 percent were in the non-reacting flocks. Of the 251,778 birds in the negative flocks 86.5 percent were in the 100 percent tested flocks.

TABLE 4.--NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
<b>Non-Reacting Flocks</b>						
Barnstable.....	3	2,442	—	—	3	2,442
Berkshire.....	2	1,243	1	235	3	1,478
Bristol.....	18	22,066	10	7,403	28	29,469
Essex.....	8	4,786	7	7,289	15	12,075
Franklin.....	11	16,809	1	372	12	17,181
Hampden.....	12	8,917	3	1,306	15	10,223
Hampshire.....	16	13,443	3	737	19	14,180
Middlesex.....	37	44,641	8	3,838	45	48,479
Norfolk.....	14	53,445	8	4,086	22	57,531
Plymouth.....	18	21,587	6	3,370	24	24,957
Suffolk.....	1	597	—	—	1	597
Worcester.....	23	31,670	3	1,496	26	33,166
Totals.....	163	221,646	50	30,132	213	251,778
<b>Positive Flocks</b>						
Berkshire.....	3	4,720	1	437	4	5,157
Bristol.....	2	4,505	4	2,217	6	6,722
Essex.....	1	605	—	—	1	605
Franklin.....	2	1,123	1	1,343	3	2,466
Hampden.....	4	2,356	—	—	4	2,356
Hampshire.....	—	—	2	1,874	2	1,874
Middlesex.....	2	3,068	2	2,534	4	5,602
Worcester.....	5	4,323	2	241	7	4,564
Totals.....	19	20,700	12	8,646	31	29,346

These data show progress in eradication as compared with the results of 1933-34, when four-fifths of the total tested birds were found in non-reacting flocks. It is encouraging that the amount of infection is gradually being reduced and that the poultrymen are demonstrating that it is possible not only to eradicate infection but also to maintain flocks free from the infection. This task will become less difficult as the bulk of infection decreases and poultrymen become better fortified to guard against the introduction of infection through different channels.

## COMPARISON OF 1933-34 AND 1934-35 SEASONS

The results of the 1933-34 and 1934-35 testing seasons are given in Table 5. The number of tested flocks was slightly less in 1934-35 than in 1933-34, but increases were observed in the number of tested birds and tests. The average percentage of positive tests was less for the 1934-35 season. In 1933-34, two counties were without reactors and in 1934-35 three counties revealed no infection. All counties had less than 1 percent positive tests, even though four counties had a slight increase in the percentage of infection. Nine counties had an increase in the number of tested birds.

While the number of tested flocks during the past season was slightly less than during the 1933-34 season, yet 73 flocks were tested the previous season and not in 1934-35. Forty-three flock owners, who had tested for two or more consecutive years, discontinued testing in 1934-35.

TABLE 5.--COMPARISON OF 1933-34 AND 1934-35 TESTING

County	Flocks	Birds	Tests	Positive Tests Per Cent	Non-Reacting Flocks
1933-34 Season					
Barnstable.....	2	2,605	2,605	0.00	2
Berkshire.....	7	5,730	5,912	0.86	5
Bristol.....	32	26,427	26,918	1.05	30
Essex.....	24	20,818	20,818	0.02	23
Franklin.....	15	18,017	18,017	0.71	13
Hampden.....	14	9,291	9,291	0.68	12
Hampshire.....	23	15,677	17,021	0.09	20
Middlesex.....	52	51,522	52,746	0.19	43
Norfolk.....	25	51,667	65,636	0.92	22
Plymouth.....	24	21,541	24,211	0.53	22
Suffolk.....	1	546	546	0.00	1
Worcester.....	43	39,400	41,127	0.33	36
Totals.....	262	263,241	284,848	0.53	229
1934-35 Season					
Barnstable.....	3	2,442	2,442	0.00	3
Berkshire.....	7	6,635	6,635	0.59	3
Bristol.....	34	36,191	43,807	0.77	28
Essex.....	16	12,680	13,621	0.23	15
Franklin.....	15	19,647	19,647	0.90	12
Hampden.....	19	12,579	14,721	0.41	15
Hampshire.....	21	16,054	18,340	0.82	19
Middlesex.....	49	54,081	56,985	0.43	45
Norfolk.....	22	57,531	57,622	0.005	22
Plymouth.....	24	24,957	24,957	0.00	24
Suffolk.....	1	597	597	0.00	1
Worcester.....	33	37,730	42,513	0.33	26
Totals.....	244	281,124	301,887	0.39	213

Discontinued and intermittent testing lead to retardation in the progress of pullorum-disease eradication. The fact that pullorum infection is still widespread necessitates the cooperation of every poultryman in having his flock tested annually to reduce the infection and maintain known pullorum-clean flocks.

Some poultrymen have been led to believe that the whole-blood test will suffice for the same purpose as the standard tube test, which is used in the laboratory. Recent observations have substantiated that the whole-blood test is not as efficient and sensitive as the standard tube test for complete eradication of the disease and in determining the true status of a flock.

The primary object of pullorum-disease testing in Massachusetts is to maintain the flock free from the disease and to establish additional clean flocks through closely supervised testing and supervised replacements from known free flocks. The progress and success of such a testing program depend largely upon the cooperation received from the poultrymen and other poultry agencies. A disease control and eradication program can accomplish little when it is not properly organized, supervised and carried out. Every poultryman should feel his responsibility in supporting a program that has the definite objective of benefiting the entire poultry industry.

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## FECES FROM REACTING BIRDS MAY TRANSMIT PULLORUM DISEASE

In the eradication of pullorum disease the question is frequently presented concerning the possibility of spreading the infection by means of the droppings. While it has been clearly demonstrated that transmission takes place among birds in a laying flock, yet the role that droppings may play in the spread of the disease is quite vague. As will be pointed out in the following experiments, it seems that comparatively fresh droppings which might contain the organism did not act as a potent source for infecting susceptible birds, when the feces were added to the litter. Since it is recognized that infected birds may eliminate the organism through the droppings, an experiment was conducted to determine with what success and ease susceptible birds could be infected by force-feeding fresh droppings from reacting birds. The object was not to duplicate natural conditions but to set up conditions which were most apt to produce positive results.

### Experiment I. Exposure of Pullorum-Disease-Free Birds to Litter Contaminated with Feces from Positive-Reacting Birds.

In a previous report by this station<sup>1</sup> negative results were obtained when pullorum-disease-free birds were exposed to litter contaminated with feces from positive-reacting birds. Continuing the study, the following report gives the results of exposure of a second group of pullorum-free birds to litter contaminated with feces from positive-reacting birds.

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<sup>1</sup>Van Roekel, H., Bullis, K. L., Flint, O. S., and Clarke, M. K. 1932. Twelfth Annual Report on Eradication of Pullorum Disease in Massachusetts. Mass. Agric. Exp. Sta. Bulletin 63: 19-22.

### Procedure

Twenty-five pullorum-disease-free pullets, 17 weeks old, were put into an 8 x 12 house with a screened sun porch of the same dimensions. These pullets were purchased as day-old chicks from a flock which has been negative to the tube agglutination test for two years. They were maintained on experiment for a period of eighty-five weeks.

The feces were obtained from two groups of positive-reacting birds isolated in a 8 x 12 house and were collected from the dropping boards daily. Roosts and dropping boards were screened with wire poultry netting. Feces from Group I of the positive-reacting birds were added to the litter (shavings) daily for 21 weeks when a new group of positive-reacting birds was obtained. The addition of feces from Group II was withheld for eight weeks, when daily additions of feces were resumed and continued for 23 weeks. The pullorum-disease-free birds were held for 33 weeks following the termination of the addition of feces to the litter when they were killed and necropsied.

Approximately one-half to one quart of feces was added to the litter daily. The soiled litter was replaced completely with clean litter four times during the experiment.

Scratch grain was fed in the litter morning and afternoon.

The pullorum-disease-free birds were tested by the tube agglutination test (in dilutions of 1:10 and higher) at bi-weekly intervals. The antigen used was a composite of three known agglutinable strains of *S. pullorum* selected by the Northeastern Laboratory Workers' Conference and was prepared according to the standard methods recommended by this conference.

### Results

All birds remained negative to the tube agglutination test throughout the experiment.

The 25 birds (17 birds died during the course of the experiment) were necropsied and *S. pullorum* was not isolated.

The following table gives the data showing the length of time individual birds were maintained on experiment.

Bird No.	Number of Weeks on Experiment	Bird No.	Number of Weeks on Experiment	Bird No.	Number of Weeks on Experiment
53944	23	53953	85	53961	31
53945	85	53954	58	53962	85
53946	76	53955	85	53963	84
53947	32	53956	85	53964	43
53948	72	53957	52	53965	85
53949	51	53958	40	53966	83
53950	85	53959	73	53967	73
53951	18	53960	38	53968	33
53952	33				

The results obtained in this experiment suggest that feces from infected hens are not an important vehicle in the transmission of pullorum disease to older birds kept under an environment approaching natural conditions.

## Experiment II. Feeding Feces from Positive-Reacting Birds to Pullorum-Disease-Free Birds.

Five groups of birds were used in this experiment. Group I consisted of eight positive- and eight negative-reacting birds; Groups II and III each of 10 positive- and 10 negative-reacting birds; Group IV of two positive- and five negative-reacting birds; and Group V of 13 positive- and 14 negative-reacting birds.

### Collection of Feces

The positive-reacting hens were placed in coops with removable screen bottoms and metal dropping trays. Newspapers were spread in the trays to facilitate cleaning. Feces from the positive-reacting hens were collected each morning in individual enamel cups. No feces were collected when eggs had been laid and broken, allowing egg contents to mix with feces. After collection of feces, the soiled newspapers were replaced each morning with clean newspapers.

### Feeding of Feces

The positive and negative birds were paired so that each non-reacting female received feces from the same positive hen throughout the experiment. The collected feces were moistened sufficiently with tap water to mould into pellets for feeding. Feedings were administered orally six mornings a week for eight weeks. The non-reacting birds in Groups I and II were held for 24 weeks following the last feeding of feces, and those in Groups III, IV and V for 8 weeks following the last feeding of feces, at the end of which time the birds were killed and necropsied. Groups I, II, III and IV received 25 grams of moistened feces at each feeding and Group V received 15 grams at each feeding.

Data in Table 6 show the numbers of positive-reacting hens and their maximum agglutination titres at the beginning of the experiment, the numbers of the non-reacting birds, the number of feedings each bird received, and their maximum agglutination titres exhibited during the experiment.

All hens were tested at bi-weekly intervals by the tube agglutination test, except Group V which was tested at weekly intervals.

### Results

*Group I.* Seven of the eight non-reacting birds remained negative to the tube agglutination test throughout the experiment, and *S. pullorum* was not isolated on necropsy. The eighth hen (39348) developed agglutinins during the fifth week and later a maximum agglutination titre of 1:5120 was attained. The bird died on the 49th day after the last feeding. *S. pullorum* was isolated from the pericardial fluid, liver, spleen and ovary.

*Group II.* All of the non-reacting hens remained negative to the tube agglutination test throughout the experiment, and *S. pullorum* was not isolated on necropsy.

*Group III.* Eight of the ten non-reacting birds remained negative throughout the experiment, and *S. pullorum* was not isolated on necropsy. The remaining two birds (60971 and 60975) developed agglutinins during the second and fourth weeks, respectively. The maximum agglutination titres exhibited by hens 60971 and 60975 were 1:2560 and 1:5120, respectively. *S. pullorum* was isolated from the ovary and spleen of 60971 and from the ovary of 60975.

TABLE 6.--DATA CONCERNING BIRDS FED FECES  
FROM POSITIVE REACTING BIRDS

Group	Positive Birds		Negative Birds		
	Bird No.	Maximum Agglutination Titre	Bird No.	Number of Feedings	Maximum Agglutination Titre
I.....	11790	2,560	39347	46	0
	11705	10,210	39348	39	5,120
	11706	160	39319	18	0
	11781	2,560	39350	50	0
	11766	1,280	39351	37	0
	11836	2,560	39352	43	0
	11765	2,560	39353	50	0
	11707	2,560	39354	50	0
II.....	53614	20,480	39361	47	0
	53623	1,280	39362	46	0
	53676	2,560	39363	7	0
	53685	320	39364	47	0
	53693	640	39365	46	0
	53709	1,280	39366	47	0
	53714	2,560	39367	47	0
	53717	1,280	39368	8	0
	53747	1,280	39369	47	0
	53755	1,280	39370	47	0
III.....	91904	160	60969	36	0
	91910	160	60970	44	0
	91913	320	60971	35	2,560
	91963	160	60972	41	0
	91967	640	60973	41	0
	92011	640	60974	11	0
	92002	80	60975	23	5,120
	92016	640	60976	34	0
	92018	5,120	60977	40	0
	92056	320	60978	45	0
IV.....	91913	160	60984	42	5,120
	92002	160	60985	36	0
			60986	45	0
			60987	44	0
			60988	Control	0
V.....	90993	320	99373	39	0
	53747	640	99375	44	0
	91833	320	99376	41	0
	60964	640	99377	35	0
	91985	320	99378	33	0
	91731	320	99379	44	0
	91822	1,280	99380	31	5,120
	91038	640	99381	43	1,280
	92018	2,560	99382	5	Died
	92056	640	99384	41	0
	91920	160	99385	26	0
	60967	1,280	99386	34	0
	60965	1,280	99387	21	0
			99388	Control	0

*Group IV.* The five non-reacting birds in this group were so divided that two were assigned to each of two positive-reacting birds, the fifth non-reacting bird being retained as a control. The positive-reacting birds used in this group were two whose corresponding non-reacting birds in Group III developed agglutinins and yielded *S. pullorum* on necropsy. The control and three of the four non-reacting birds receiving feces remained negative to the tube agglutination test throughout the experiment, and *S. pullorum* was not isolated on necropsy. Bird 60984 first reacted during the fourth week and later developed an agglutination titre of 1:5120. *S. pullorum* was isolated from the peritoneum, ovary and an abdominal cyst.

*Group V.* Bird 99382 died during the first week of the experiment and *S. pullorum* was not isolated on necropsy. Of the remaining 13 non-reacting birds 11 remained negative to the tube agglutination test throughout the experiment, and *S. pullorum* was not isolated on necropsy. Birds 99380 and 99381 revealed an agglutination titre during the ninth and fourteenth weeks, respectively. The maximum agglutination titres for birds 99380 and 99381 were 1:5120 and 1:1280, respectively. Bird 99381 revealed no gross lesions, and *S. pullorum* was not isolated. *S. pullorum* was isolated from the pericardial fluid, peritoneum, and ovary of bird 99380.

#### Conclusions

1. While the incidence of infection is small, it is apparent that feces from positive-reacting birds when force-fed to non-reacting birds may act as a vehicle of transmission for pullorum disease.
2. There is no apparent direct correlation between the agglutination titre of the infected birds and the infectivity of their feces to transmit the disease to susceptible fowl. Of the six positive-reacting birds whose corresponding non-reacting birds developed agglutinins, four exhibited a relatively low agglutination titre.

MASSACHUSETTS

AGRICULTURAL EXPERIMENT STATION

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Control Series

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## Inspection of Commercial Feedstuffs

By Philip H. Smith

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This is the forty-first report of feeding stuffs inspection and presents the results of the analyses of 1651 samples of feeding stuffs intended for live stock and poultry consumption, collected during the year ending September 1, 1935. In addition will be found the analyses of 25 tinned dog foods offered for sale in Massachusetts.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.



# INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith<sup>1</sup>

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The past season has proved uneventful in the feed industry for conditions pertaining to inspection and quality. While it is probably true that the importation of feeds has exceeded that of any preceding season, insofar as has been determined they have been on a par with like products of domestic origin. The chief problem has been to secure proper registration of importations. There is no good reason why importers should not register when they sell in direct competition with domestic producers who comply with the statute in every particular.

The Massachusetts Control Service has not as yet been able to attack the problems presented through the sale of cod liver oil and other vitamin carriers. A start has been made in the partial equipment of a biological laboratory. Just how far the project can be carried will depend upon money made available with which to carry on the work.

In an attempt to answer some of the inquiries received for information about canned dog foods, twenty-five of the brands commonly sold in Massachusetts were collected and analyzed. The results appear elsewhere in this bulletin.

Of the 1,651 samples of feeding stuffs collected, 73, or 4.4 per cent, are listed as varying from guaranteed analysis. Variations of less than one per cent below minimum guarantee in protein and fat or of less than one per cent above maximum guarantee of fiber are not tabulated in the table of deficiencies. The rate of deficiencies as reported in the last bulletin was 5.9 per cent. It is probably true that most of the deficiencies occur not because of intent to defraud, but rather because of lack of proper chemical control of operations.

During the past year 1,021 brands of feed have been registered for sale by 212 manufacturers and dealers; 1,651 samples of feeding stuffs have been collected and subjected to analysis; 178 dealers located in 105 towns have been visited by the feed inspector at least once.

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<sup>1</sup>The following staff members assisted in the inspection: Albert F. Spelman and John W. Kuzmeski, Chemists; Frederick A. McLaughlin, Microscopist; James T. Howard, Inspector; Cora B. Grover, Clerk.

Complete Average Analyses of Feeds Collected (Per Cent).  
I. UNMIXED BY-PRODUCTS.  
(a) Protein Feeds.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
Cottonseed Meal.											
3	Empire High Grade <sup>1</sup>	E. T. Allen Co. . . . .	6.6	42.0	41.0	6.2	6.0	29.0	9.5	10.0	6.7
2	Empire 41% Protein Prime Quality . .	E. T. Allen Co. . . . .	7.1	43.1	41.0	7.4	5.5	26.8	9.0	13.0	6.6
1	Atlas 36% Protein . . . . .	Ashcraft-Wilkinson Co. . .	7.6	36.5	36.0	5.7	5.0	30.2	14.2	16.0	5.8
4	Cow-Eta Brand 41% Prime Quality . .	Ashcraft-Wilkinson Co. . .	7.0	42.1	41.0	6.9	5.0	27.1	9.9	13.0	7.0
4	Helmet Brand 41% Prime . . . . .	Ashcraft-Wilkinson Co. . .	7.8	41.0	41.0	6.3	5.5	28.4	10.0	10.0	6.5
3	Paramount Brand Prime <sup>1</sup> . . . . .	Ashcraft-Wilkinson Co. . .	7.4	36.9	36.0	6.5	5.0	30.3	13.0	14.0	5.9
4	Paramount Brand . . . . .	Ashcraft-Wilkinson Co. . .	7.3	37.8	36.0	8.9	4.5	29.3	7.8	16.0	8.9
2	"Miss Cairo" Brand 41% . . . . .	Cairo Meal & Cake Co. . .	7.4	41.0	41.0	6.9	6.0	28.9	8.5	10.0	7.3
1	"Miss Cairo" 36% . . . . .	Cairo Meal & Cake Co. . .	8.5	36.6	36.0	6.1	5.0	30.2	12.0	12.0	6.6
2	Eastern States 41% Protein Choice . .	Eastern States Farmers' Exchange	6.9	41.6	41.0	6.6	6.0	28.7	9.6	10.0	6.6
16	Dixie Brand Prime 41% Protein . . . .	Humphreys-Godwin Co. . .	7.2	42.7	41.0	6.8	5.0	27.5	8.8	12.0	7.0
1	Danish Brand Prime 36% Protein . . .	Humphreys-Godwin Co. . .	7.0	38.8	36.0	5.9	5.0	29.8	12.7	13.0	5.8
1	"Lovit Brand" 41% Protein Prime Quality	L. R. Lovitt & Co. . . . .	6.3	42.0	41.0	6.0	5.0	28.7	9.8	13.0	7.2
2	"Lovit Brand" 36% Protein . . . . .	L. B. Lovitt & Co. . . . .	7.7	37.3	36.0	5.4	4.5	30.7	12.7	16.0	6.2
1	Maurice Pincoffs 41% Protein . . . . .	Maurice Pincoffs Co. . . . .	6.9	41.2	41.0	6.6	5.0	28.9	9.7	14.0	6.7
2	Maurice Pincoffs 41% Protein . . . . .	Ralston Purina Co. . . . .	7.0	41.2	41.0	6.6	5.0	28.9	10.2	12.0	6.1
3	Texas Bull Brand 41% Protein . . . .	Transit Milling Co. . . . .	7.9	41.9	41.0	6.4	5.0	26.9	11.2	11.0	5.7
Linseed Meal.											
3	34% Protein Old Process . . . . .	Archer-Daniels-Midland Co. .	8.9	33.9	34.0	5.5	4.5	36.7	8.3	9.0	6.7
2	32% Protein Old Process . . . . .	Archer-Daniels-Midland Co. .	8.2	34.9	32.0	5.4	4.5	37.4	8.2	9.0	5.9
1	Bisbee 34% Protein Pure Old Process .	Bisbee Linseed Co. . . . .	8.9	38.5	34.0	6.1	5.0	33.6	7.5	10.0	5.4
1	Pure Old Process . . . . .	Hirst & Begley Linseed Works	7.9	40.4	37.0	6.6	5.0	32.3	7.3	9.0	5.5
5	K & M Brand 34% Protein Old Process .	Kellogg & Miller, Inc. . . .	7.9	35.3	34.0	6.1	5.0	36.3	7.8	10.0	6.6
5	Kellogg's 34% Pure Old Process . . .	Spencer Kellogg & Sons, Inc. .	9.0	35.1	34.0	5.1	4.5	37.5	8.1	9.0	5.2
7	Kellogg's 32% Pure Old Process . . .	Spencer Kellogg & Sons, Inc. .	8.7	34.6	32.0	5.3	4.5	37.0	8.2	9.0	6.2
1	Diamond K Linseed Meal with Flaxseed	Spencer Kellogg & Sons, Inc. .	9.7	32.0	30.0	5.0	4.5	39.1	8.1	10.0	6.1
1	Screenings . . . . .	Sherwin Williams Co.. . . .	8.4	38.6	31.0	6.2	4.5	34.7	7.2	9.0	4.9
1	SWC 34% Pure . . . . .	Sherwin Williams Co.. . . .									

1934 registration.

## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## I. UNMIXED BY-PRODUCTS — Continued.

## (a) Protein Feeds — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
		<b>Soybean Oil Meal.</b>									
2	Soybean Oil Meal	Allied Mills, Inc.	7.9	45.9	41.0	6.3	5.0	30.0	4.7	7.0	5.2
3	Super Soy	Allied Mills, Inc.	8.6	40.1	37.0	5.5	5.0	31.3	4.8	6.5	9.7
1	Soy Bean Oil Meal	Ralston Purina Co.	7.5	44.6	41.0	6.2	4.9	31.5	4.9	7.0	5.3
4	Staley's Soy Bean Oil Meal	A. E. Staley Manufacturing Co.	8.2	44.2	41.0	4.9	4.5	32.0	5.4	7.0	5.3
		<b>Gluten Meal.</b>									
3	Amazo	American Maize-Products Co.	8.3	44.7	40.0	1.2	1.0	43.4	1.3	4.0	1.1
7	Diamond Corn	Corn Products Refining Co.	8.4	44.4	43.0	1.7	1.0	42.1	2.2	4.0	1.2
3	Douglas Corn	Penick & Ford Ltd., Inc.	8.6	45.4	43.0	1.7	1.0	37.3	3.8	4.0	3.2
3	Union Corn	Union Starch & Refining Co.	7.2	46.6	43.0	1.0	1.0	43.2	1.1	3.0	0.9
		<b>Gluten Feed.</b>									
5	Cream of Corn	American Maize-Products Co.	9.1	28.3	25.0	4.3	2.0	45.4	7.3	8.5	5.6
1	Bacon's	E. R. Bacon Grain Co.	7.4	26.1	24.0	3.6	2.0	52.4	6.6	8.0	3.9
5	Clinton Corn	Clinton Co.	9.9	28.8	25.0	2.8	2.0	44.6	6.6	8.5	7.2
12	Buffalo Corn	Corn Products Refining Co.	9.5	27.6	25.0	2.3	2.0	46.6	7.3	8.5	6.7
2	Heavy Buffalo Corn (Sweetened)	Corn Products Refining Co.	12.1	23.0	20.0	1.6	1.0	50.8	6.3	7.0	6.2
4	Ke-OK-uk	Hubinger Co.	8.8	28.1	25.0	2.7	2.0	48.5	6.9	8.5	5.0
3	Douglas Corn	Penick & Ford Ltd., Inc.	10.1	27.8	25.0	2.2	1.5	45.3	7.5	8.5	7.1
14	Staley's Corn	A. E. Staley Manufacturing Co.	9.3	29.2	25.0	1.8	1.0	46.0	6.1	8.0	6.7
5	Union Corn	Union Starch & Refining Co.	10.4	27.7	25.0	2.2	1.0	47.0	6.4	8.0	5.4
		<b>Brewers' Grains.</b>									
2	"Hiquality"	Donahoe-Stratton Co.	6.9	20.9	24.0	5.8	5.0	44.8	18.1	19.0	3.5
10	"Bull Brand"	Farmers Feed Co.	5.9	28.6	24.0	6.5	6.0	41.7	14.2	17.0	3.1
3	Brewers Dried Grains	New England Brewery & Distillery Grain Co.	6.0	30.8	28.0	6.8	6.0	40.2	12.7	15.0	3.5
2	Brewers Dried Grains	St. Albans Grain Co.	6.4	26.6	21.0	6.6	5.0	42.9	14.1	15.0	3.4
		<b>Reg Dog and Low Grade Flour</b>									
1	Sanfed Red Dog—Pure Wheat Product	Commander-Larabee Corp.	10.9	21.8	16.0	4.6	4.0	55.6	3.6	4.0	3.5

1	Arlington Second Clear Flour	General Mills, Inc.	10.3	17.5	14.0	2.5	3.0	67.5	0.2	1.5	2.0
1	Hood-Red Arrow Flour Middlings	Hood Mills Co.	9.4	17.4	14.0	3.8	3.0	59.9	5.7	5.0	3.8
1	Blackhawk Wheat Flour Middlings	International Milling Co.	11.2	20.3	16.0	4.5	3.5	58.2	3.2	4.0	2.6
1	Blackhawk Wheat Red Dog	International Milling Co.	9.3	20.6	16.0	4.6	3.5	59.0	3.6	4.0	2.9
5	Moon's Fresh Ground Wheat Middlings*	Geo. Q. Moon & Co., Inc.	10.5	16.2	14.0	3.4	2.85	65.4	2.3	7.5	2.2
<b>Flour Middlings.</b>											
2	*D. & G. Wheat Flour Middlings	Dietrich & Gambrill, Inc.	9.2	19.1	16.0	4.6	4.0	58.7	4.9	6.0	3.5
1	*Lucky Hard Wheat Standard Middlings	Federal Mill, Inc.	10.1	17.8	15.0	4.6	4.5	58.7	5.3	9.5	3.5
3	Moon's Fresh Ground Wheat Middlings	Geo. Q. Moon & Co., Inc.	9.9	17.4	14.0	5.1	2.85	57.2	5.1	7.5	3.9
1	Choice Wheat Red Dog	Niagara Falls Milling Co.	9.2	19.8	16.0	3.9	4.0	58.6	5.0	4.0	3.5
1	*Niagara Standard Wheat Middlings	Niagara Falls Milling Co.	10.8	20.2	15.5	4.8	4.5	54.9	5.3	7.0	4.0
1	Wirthmore Flour Middlings	St. Albans Grain Co.	8.7	21.2	15.0	5.0	4.0	54.2	4.7	6.0	6.2
2	Stratton's Middlings	Stratton & Co.	10.2	16.9	16.0	4.6	5.63	58.1	5.8	9.5	4.4
<b>Wheat Standard Middlings.</b>											
1	Canadian Pure Shorts	S. J. Cherry & Sons, Ltd.	9.4	19.5	16.0	6.7	5.0	53.9	6.6	8.0	3.9
1	*Sunfed Wheat Standard Middlings	Commander-Larabee Corp.	8.8	17.7	14.5	5.5	4.0	54.5	8.4	9.5	5.1
2	Copeland's "Dandy Shorts"	Copeland Flour Mills Ltd.	8.9	20.4	16.0	6.2	5.0	53.8	6.5	8.0	4.2
1	Standard Middlings	Fairchild Milling Co.	9.6	18.9	16.0	4.9	4.0	56.1	6.1	9.5	4.4
3	*Washburn's Gold Medal Hard Wheat Standard Middlings	General Mills, Inc.	10.1	18.5	15.0	4.5	4.0	55.8	6.6	9.5	4.5
2	"Hamco" Brand Wheat Shorts	Frank B. Ham & Co., Ltd.	9.5	19.1	16.0	5.8	5.0	53.8	7.5	8.0	4.3
1	*Wheat Standard Middlings	Hecker-Jones-Jewell Milling Division	8.9	20.8	15.0	6.3	4.75	51.0	8.6	9.5	4.4
2	*King Midas Wheat Standard Middlings	King Midas Mill Co.	9.5	18.5	15.0	5.7	4.0	54.2	7.4	9.5	4.7
5	Lakewoods Wheat Shorts	Lake of the Woods Milling Co., Ltd.	10.0	19.0	16.0	5.9	5.0	53.7	7.0	8.0	4.4
1	*Rex Wheat Middlings	Maple Leaf Milling Co., Ltd.	9.7	18.9	16.0	6.2	5.0	53.6	7.4	7.5	4.2
1	Moon's Fresh Ground Wheat Middlings	Geo. Q. Moon & Co., Inc.	9.3	17.3	14.0	5.1	2.85	58.0	6.4	7.5	3.9
2	*Niagara Wheat Middlings	Niagara Falls Milling Co.	9.4	21.1	15.5	4.8	4.5	53.0	7.1	7.0	4.6
2	Wheat Standard Middlings	Northwestern Consolidated Milling Div.	8.5	18.8	15.0	5.8	4.0	53.3	8.5	9.5	5.1
1	Parrish Pure Wheat Shorts	Parrish & Heimbecker, Ltd.	10.4	18.6	16.0	6.4	5.0	53.5	7.1	8.0	4.0
1	*Pillsbury's Hard Wheat Standard B Middlings	Pillsbury Flour Mills Co.	9.0	18.2	15.0	5.3	4.0	55.0	7.6	9.5	4.9
1	Bell Cow Shorts	Quaker Oats Co.	8.2	18.8	15.0	5.5	4.0	56.8	6.6	8.0	4.1
<b>Wheat Mixed Feed.</b>											
1	Prize Mixed Feed	C. W. Brister & Son	9.4	17.4	14.0	4.1	3.5	58.8	6.5	9.0	3.8
2	Cowley's Heavy Mixed Feed	Nicolas Courcy	9.8	17.4	16.0	3.2	4.5	57.4	5.0	7.0	6.2
1	Coweco Heavy Mixed Feed	E. A. Cowee Co.	9.6	17.0	15.0	4.4	4.0	59.3	6.4	7.0	4.3
1	King Wheat Feed	Cutler Co.	9.1	15.0	15.0	5.2	3.75	54.6	8.0	8.0	5.0
1	D. & G. Wheat Mixed Feed	Dietrich & Gambrill, Inc.	10.0	17.5	15.0	4.5	3.5	56.6	6.8	7.5	4.6
1	Full Value Mixed Feed	J. L. Dunnell & Son	9.5	18.9	15.0	4.5	5.0	56.8	6.0	6.0	4.3
7	Pure Camel Fancy Wheat Feed	Excelsior Milling Co.	9.2	16.2	16.0	4.1	4.0	58.3	7.0	7.5	5.2

\*With screenings.

†Contains added salt and calcite flour.

## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## I. UNMIXED BY-PRODUCTS — Continued.

## (a) Protein Feeds — Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
<b>Wheat Mixed Feed—Concluded</b>											
5	*Washburn's Gold Medal Fancy Mixed Feed	General Mills, Inc.	9.5	18.2	15.0	4.2	3.5	57.5	6.1	7.5	4.5
1	*"Gold Mine" Feed	H. H. King Flour Mills Co.	8.1	18.0	15.0	4.4	4.5	56.9	7.4	9.5	5.2
4	*Moon's Fresh Ground Mixed Feed	Geo. Q. Moon & Co., Inc.	9.9	17.0	15.0	4.4	4.0	57.1	7.2	10.0	4.4
2	Planet Feed	Northwestern Consolidated Milling Div.	9.2	19.1	15.0	5.3	4.0	55.1	6.2	8.0	4.8
1	*Wheat Mixed Feed	Northwestern Consolidated Milling Div.	9.2	18.3	15.0	5.2	4.0	52.8	8.5	8.5	6.0
1	Yankee Mixed Feed	Park & Pollard Co.	9.4	19.4	15.3	5.1	3.85	52.6	8.1	10.25	5.1
4	*Pillsbury's Fancy Mixed Feed	Pillsbury Flour Mills Co.	9.0	19.1	15.0	5.0	4.0	56.8	5.8	8.5	4.3
3	Buckeye Feed	Quaker Oats Co.	9.9	17.0	15.5	4.5	4.5	56.4	6.9	10.0	5.3
10	Hard Wheat Occident Mixed Feed	Russell-Miller Milling Co.	9.4	19.7	15.0	5.3	4.5	53.2	7.5	9.5	4.9
7	*Wirthmore Wheat Feed	St. Albans Grain Co.	9.6	18.0	15.0	4.7	3.75	56.0	7.1	8.0	4.6
5	Litchfield Heavy Mixed Feed	F. W. Stock & Sons	9.7	18.2	16.0	4.0	4.0	55.8	7.6	8.0	4.7
6	*Stratton's Mixed Feed	Stratton & Co.	9.5	16.3	13.5	4.1	4.11	58.1	6.9	7.13	5.1
<b>Wheat Bran.</b>											
5	*Argentine Wheat Bran	Bradley & Baker	8.7	16.3	13.0	4.2	4.0	53.1	11.3	13.0	6.4
1	Canadian Pure Bran	S. J. Cherry & Sons, Ltd.	9.2	16.3	15.0	5.1	3.5	51.2	12.1	11.5	5.8
2	Copeland's "Dandy Bran"	Copeland Flour Mills, Ltd.	9.1	18.4	15.0	5.6	3.5	51.3	10.2	11.5	5.4
2	*Duluth Imperial Wheat Bran	Duluth-Superior Milling Division	9.6	19.4	15.0	5.1	3.75	51.0	8.5	13.0	5.5
1	*Eagle Wheat Bran	Eagle Roller Mill Co.	8.1	17.6	14.0	5.3	4.0	52.3	10.3	12.0	6.4
2	*Lucky Hard Wheat Bran	Federal Mill, Inc.	8.9	19.0	14.0	5.0	3.0	51.4	9.2	14.0	6.5
5	*Washburn's Gold Medal Hard Wheat Bran	General Mills, Inc.	9.0	17.6	14.0	4.7	4.0	52.8	9.8	12.0	6.1
4	"Hamco" Brand Wheat Bran	Frank B. Ham & Co., Ltd.	8.9	16.8	15.0	5.3	3.5	52.6	10.9	11.5	5.5
3	Blackhawk Pure Wheat Bran	International Milling Co.	9.0	17.2	15.0	5.2	3.2	52.3	10.3	12.0	6.0
1	*Sunfed Winter Wheat Bran	Larabee Flour Mills Co.	9.0	17.6	15.0	4.2	3.5	52.8	9.7	11.0	6.7
4	*Rex Wheat Bran	Maple Leaf Milling Co., Ltd.	9.0	16.6	15.0	5.2	3.5	52.4	11.1	12.0	5.7
5	*Moon's Wheat Bran	Geo. Q. Moon & Co., Inc.	9.7	17.3	15.0	4.0	3.0	56.8	7.3	10.0	4.9
2	Big B Wheat Bran	Moseley & Motley Milling Co.	8.4	18.7	13.5	5.2	3.0	52.1	9.5	13.0	6.1
2	Niagara Choice Wheat Bran	Niagara Falls Milling Co.	8.8	19.0	15.5	4.6	4.0	51.3	9.9	11.0	6.4
3	Pure Wheat Bran	Northwestern Consolidated Milling Div.	8.5	17.9	14.0	5.0	4.0	52.1	9.9	12.0	6.6
5	Parrish & Heimbecker, Ltd.	Parrish & Heimbecker, Ltd.	9.0	16.9	15.0	5.4	3.5	52.4	10.7	11.5	5.6
2	*Pillsbury's Hard Wheat Bran	Pillsbury Flour Mills Co.	8.7	17.8	14.0	4.6	4.0	54.1	9.2	12.0	5.6

## (b) Starchy Feeds.

	Bell Cow Bran	Hard Wheat Occident Bran	Premier Bran	Stratton's Bran	Victor Spring Wheat Bran	Pioneer Wheat Bran	Quaker Oats Co.	Russell-Miller Milling Co.	St. Lawrence Flour Mills Co., Ltd.	Stratton & Co.	Victor Flour Mills, Inc.	Western Canada Flour Mills, Ltd.	8.0	18.7	15.0	5.5	3.5	52.4	9.8	10.0	5.6
1													9.1	17.4	14.0	5.4	4.0	53.4	9.0	11.5	5.7
2													9.3	17.8	15.0	5.5	3.5	52.2	10.9	11.5	5.4
3													8.9	16.4	14.0	4.2	4.0	56.7	7.7	11.0	5.7
1													8.9	18.2	15.0	3.6	4.0	55.2	8.9	11.0	5.2
2													9.0	17.2	15.0	5.4	3.5	51.2	11.5	11.5	5.7
<b>Hominy Feed.</b>																					
3	Homco						Decatur Milling Co., Inc.						9.1	11.4	10.0	8.7	7.0	63.5	4.5	6.0	2.8
2	Emco						Evans Milling Co.						8.5	12.5	10.0	7.8	6.0	62.2	5.7	6.0	3.3
4	White						Kellogg Co.						8.3	11.5	10.0	7.1	6.0	66.4	4.1	5.0	2.5
8	Badger White						Chas. A. Krause Milling Co.						8.7	11.9	10.0	6.0	5.0	64.1	4.7	5.0	2.8
3	Choice Steam Cooked						Miner-Hillard Milling Co.						9.6	11.2	10.0	8.3	5.0	66.9	3.9	5.0	2.4
8	Moon's						Geo O. Moon & Co., Inc.						9.1	12.8	10.0	6.6	5.0	64.4	4.7	6.0	2.4
6	Hominy Feed						Patent Cereals Co.						9.1	12.8	10.0	7.6	6.0	64.2	4.4	5.0	2.7
3	Burt's						Postum Co., Inc.						8.8	11.8	10.0	6.8	5.0	64.2	4.6	5.0	3.0
1	White						Quaker Oats Co.						8.8	11.3	10.0	6.8	5.0	65.8	5.0	5.0	2.3
<b>Dried Beet Pulp.</b>																					
10	Dried Beet Pulp						Larowe Milling Co.						8.8	9.3	7.0	0.4	0.3	58.5	19.9	22.5	3.1
2	Dried Molasses-Beet Pulp						Larowe Milling Co.						8.2	8.3	7.0	0.4	0.3	62.4	17.1	20.0	3.6
<b>Rye Feed.</b>																					
4	Upper Hudson						Upper Hudson Rye Flour Mills, Inc.						9.0	13.4	15.5	2.8	3.0	67.9	3.7	6.0	3.2
1	Irving Mills						Van Vechten Milling Co., Inc.						9.4	18.1	13.0	3.3	2.0	61.5	4.2	10.0	3.5
<b>Oat Feed.</b>																					
1	Oat Mill Feed						Hecker-H-O Co., Inc.						4.7	6.7	6.0	2.0	2.0	50.5	29.3	28.0	6.8
2	Re-Ground Oat Feed						Northern Illinois Cereal Co.						6.5	3.8	3.5	0.8	1.25	48.4	33.1	35.0	7.4
3	Vim Oat Mill Feed						Quaker Oats Co.						6.4	4.9	5.0	1.6	1.5	51.4	29.5	30.0	6.2
1	Sugared Vim Oat Mill Feed						Quaker Oats Co.						6.4	6.0	5.0	1.7	1.25	53.7	25.6	27.5	6.6

\*With screenings.

## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## II. PREPARED FEEDS.

## (a) Protein Feeds.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.		Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.				
	<b>Dairy and Molasses Feeds (more than 15 per cent protein).</b>											
1	Wayne Amco 32% Supplement Dairy Ration	Allied Mills, Inc.	8.8	33.0	4.3	4.0	38.7	6.0	9.0	9.2		
2	Emoire 24% Dairy Ration	Allied Mills, Inc.	8.1	24.7	4.4	3.0	47.4	8.0	12.0	7.4		
4	Wayne Amco 24% Dairy Ration	Allied Mills, Inc.	8.8	25.3	4.9	3.5	45.5	7.8	9.0	7.7		
6	Empire 20% Dairy Ration	Allied Mills, Inc.	8.7	22.1	4.1	3.0	48.0	9.2	12.0	7.9		
8	Wayne Amco 20% Dairy Ration	Allied Mills, Inc.	9.0	22.1	4.4	3.5	49.3	7.1	9.0	8.1		
2	Empire 16½% Dairy Ration	Allied Mills, Inc.	9.0	18.4	3.9	3.0	50.4	9.7	12.0	8.6		
1	20% Balanced Ration	A. P. Ames Co.	8.4	22.1	4.0	4.0	46.3	8.4	9.0	10.8		
5	Academy 24% Open Formula Production Ration	Academy Farms Milling Co.	9.3	24.2	3.0	4.0	46.7	7.8	9.0	9.0		
6	Academy 20% Open Formula Production Ration	Academy Farms Milling Co.	9.3	20.5	3.1	3.5	48.8	9.1	9.0	9.2		
1	Old Colony Feed	Academy Farms Milling Co.	11.0	21.5	3.6	3.5	49.2	8.6	11.0	6.1		
1	Peerless Milk Ration	Academy Farms Milling Co.	10.6	21.6	3.4	3.5	45.5	9.2	12.0	9.7		
4	Academy Sweet 16 Dairy Feed	Academy Farms Milling Co.	8.6	17.6	3.8	4.0	48.3	11.9	12.5	9.8		
1	Capital Dairy Ration Sweetened with Molasses	E. W. Bailey & Co.	9.1	25.0	4.4	4.5	48.1	6.8	9.0	6.6		
1	Beacon Dairy Ration	Beacon Milling Co., Inc.	8.8	25.0	5.0	4.5	47.0	6.8	9.0	7.4		
2	Beacon Sweet "24"	Beacon Milling Co., Inc.	10.1	25.2	4.4	4.0	46.2	7.1	9.0	7.0		
1	Auburn Brand Dairy Feed	Beacon Milling Co., Inc.	9.2	22.5	4.0	4.0	49.2	7.3	10.0	7.8		
1	Beacon Sweet	Beacon Milling Co., Inc.	9.9	21.9	4.3	4.5	50.8	6.3	9.0	6.8		
2	Beacon "20"	Beacon Milling Co., Inc.	8.7	21.9	4.9	4.5	50.5	7.9	9.0	6.1		
3	Green Mountain Dairy Ration	Berkshire Coal & Grain Co.	7.7	23.4	4.5	5.0	46.0	10.9	10.0	7.5		
2	Berkshire Hills Sweet Dairy Feed	Berkshire Coal & Grain Co.	8.1	19.4	4.0	4.5	48.8	12.7	12.0	7.0		
1	Bidwell 24% Dairy Ration	Black Rock Milling Corp.	8.6	24.2	4.3	4.0	45.5	8.7	11.0	8.7		
3	Bidwell 20% Dairy Ration	Black Rock Milling Corp.	9.1	21.4	4.3	4.0	47.1	8.9	11.0	9.2		
3	Octagon Dairy Ration	Bolduc & Son	10.5	19.5	4.6	3.5	51.3	6.8	10.0	7.3		
2	Borden's Dairy Feed	Borden Grain Co.	8.7	24.2	4.6	4.5	50.1	6.4	9.0	5.1		
2	Brown's Dairy Feed	George B. Brown	8.2	22.0	4.1	4.0	47.5	10.2	12.0	8.0		
2	Community-20 Dairy Ration	Community Feed Stores, Inc.	8.8	21.3	5.2	4.0	50.8	7.5	9.0	6.4		
1	Hilltop-20 Dairy Ration	Community Feed Stores, Inc.	9.0	21.0	4.1	3.5	47.1	11.1	12.5	7.7		



2	4	Courcy's Dairy Feed	.	.	.	.	Nicolas Courcy	6.1	7.0	6.0	7.0	6.1
2	4	Coweco 1925 Ration	.	.	.	.	F. A. Cowee Co.	7.0	10.0	7.5	10.0	7.0
2	2	Coweco 20% Ration	.	.	.	.	F. A. Cowee Co.	6.9	10.0	7.8	10.0	6.9
1	1	Coweco Lo-Price 20% Dairy Ration	.	.	.	.	F. A. Cowee Co.	8.1	9.0	8.3	9.0	8.1
2	2	Coweco Sunrise 20% Dairy Ration	.	.	.	.	F. A. Cowee Co.	6.3	10.0	8.5	10.0	6.3
2	2	Crystal 24% Dairy Ration	.	.	.	.	Curley Brothers	7.5	9.0	8.0	9.0	7.5
2	2	Crystal 20% Dairy Ration	.	.	.	.	Curley Brothers	7.5	12.0	8.5	12.0	7.5
2	2	King 20 Dairy Ration Sweetened	.	.	.	.	Cutler Co.	8.8	9.0	7.7	9.0	8.8
2	2	King 20 Dairy Feed Sweetened	.	.	.	.	Cutler Co.	6.8	8.0	6.6	8.0	6.8
2	2	Delaware Sweet 24% Dairy Feed	.	.	.	.	Delaware Mills, Inc.	7.5	9.0	7.4	9.0	7.5
1	1	Delco 24% Dairy Feed	.	.	.	.	Delaware Mills, Inc.	5.0	10.0	7.4	10.0	5.0
3	3	Delco Sweet 20% Dairy Feed	.	.	.	.	Delaware Mills, Inc.	6.8	10.0	9.2	10.0	6.8
2	2	Delco 20% Dairy Feed (Plain)	.	.	.	.	Delaware Mills, Inc.	5.3	11.0	10.2	11.0	5.3
2	2	Diauto's Dairy Feed	.	.	.	.	Frank Diauto	7.4	7.74	7.5	7.74	7.4
2	2	Gambrell's 16% Dairy Feed	.	.	.	.	F. Diehl & Son, Inc.	8.2	12.0	9.9	14.0	8.2
1	1	Excel 20% Dairy Ration	.	.	.	.	Dietrich & Gambrell, Inc.	7.1	10.0	7.5	10.0	7.1
1	1	Special Dairy Feed	.	.	.	.	J. L. Dunnell & Son	4.7	9.0	8.1	9.0	4.7
3	3	Eastern 24% Dairy Ration Sweetened	.	.	.	.	East Bridgewater Farmers' Exchange, Inc.	7.2	9.0	7.2	9.0	7.2
4	4	Eastern 20% Dairy Feed Sweetened	.	.	.	.	Eastern Grain Co.	6.9	9.0	7.0	9.0	6.9
3	3	Eastern States Milkmore Dairy Ration	.	.	.	.	Eastern Grain Co.	6.9	8.0	7.6	8.0	6.9
6	6	Eastern States Fulphul Dairy Ration	.	.	.	.	Eastern States Farmers' Exchange	5.9	8.0	6.8	8.0	5.9
4	4	Eastern States Highland 20 Dairy Ration <sup>1</sup>	.	.	.	.	Eastern States Farmers' Exchange	6.6	8.0	6.8	8.0	6.6
2	2	Eastern States Highland 20 Dairy Ration	.	.	.	.	Eastern States Farmers' Exchange	5.8	10.7	6.8	10.7	5.8
2	2	Eastern States Highland 16 Dairy Ration	.	.	.	.	Eastern States Farmers' Exchange	5.8	9.0	8.3	9.0	5.8
3	3	Eastern States Sixteen Dairy Ration	.	.	.	.	Eastern States Farmers' Exchange	5.5	8.0	6.2	8.0	5.5
2	2	The Ellis Dairy Feed	.	.	.	.	Michael W. Ellis	6.1	9.0	6.9	9.0	6.1
3	3	Emco Milk Grains	.	.	.	.	Emmore Milling Co., Inc.	6.2	11.0	8.8	11.0	6.2
1	1	Emco Feed	.	.	.	.	Emmore Milling Co., Inc.	5.8	10.0	8.8	10.0	5.8
2	2	Emmore Milk Grains Junior	.	.	.	.	Emmore Milling Co., Inc.	5.3	10.0	6.8	10.0	5.3
6	6	Granger 20% Dairy Ration	.	.	.	.	Emmore Milling Co., Inc.	6.7	11.0	6.8	11.0	6.7
2	2	Emmore's Sweet Digesto Dairy Feed	.	.	.	.	Emmore Milling Co., Inc.	7.0	12.0	13.9	12.0	7.0
1	1	Eselman Challenge Dairy Feed	.	.	.	.	Emmore Milling Co., Inc.	8.6	11.0	13.9	12.0	8.6
2	2	Eselman Red Rose 24 Dairy Feed	.	.	.	.	John W. Eselman & Sons	7.8	11.0	7.7	11.0	7.8
4	4	Eselman Certified 20% Dairy Ration	.	.	.	.	John W. Eselman & Sons	6.5	8.0	7.7	8.0	6.5
2	2	Eselman Conestoga 20 Dairy Feed	.	.	.	.	John W. Eselman & Sons	7.7	11.0	10.1	11.0	7.7
3	3	Eselman Lancast 20 Dairy Feed	.	.	.	.	John W. Eselman & Sons	9.4	11.0	8.6	11.0	9.4
2	2	Eselman Pensy 16 Dairy Feed	.	.	.	.	John W. Eselman & Sons	7.7	11.0	10.2	11.0	7.7
2	2	Diamond A Dairy Ration	.	.	.	.	Farm Service Stores, Inc.	5.7	8.0	8.5	8.0	5.7
5	5	Diamond C Dairy Feed	.	.	.	.	Farm Service Stores, Inc.	6.4	10.0	8.1	10.0	6.4
2	2	New England Dairy Ration	.	.	.	.	Farm Service Stores, Inc.	6.3	11.5	11.8	11.5	6.3
4	4	North Star 20% Dairy Feed	.	.	.	.	Farm Service Stores, Inc.	7.8	12.0	8.8	12.0	7.8
1	1	Vigor 16% Dairy	.	.	.	.	Farm Service Stores, Inc.	8.0	11.0	8.4	11.0	8.0
3	3	Flory's Dairy Feed	.	.	.	.	Flory Milling Co., Inc.	9.6	11.0	9.6	11.0	9.6

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Complete Average Analyses of Feed Collected (Per Cent) — Continued  
 II. PREPARED FEEDS — Continued.  
 (a) Protein Feeds — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.		Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Dairy and Molasses Feeds (more than 15 per cent protein)—Continued.</b>											
3	Record Dairy Feed . . . . .	Flory Milling Co., Inc. . . . .	20.1	20.0	9.6		3.4	4.5	49.2	9.6	9.0	8.1
1	National Dairy Feed . . . . .	Flory Milling Co., Inc. . . . .	16.4	16.0	10.0		3.2	3.5	54.0	9.1	12.0	7.3
2	Garland's 24% Ration . . . . .	J. B. Garland & Son . . . . .	24.2	24.0	7.8		3.8	3.5	46.2	7.8	10.0	8.2
2	Garland's Economy 20% Dairy Ration . . . . .	J. B. Garland & Son . . . . .	21.3	20.0	8.6		4.2	3.0	50.0	7.4	9.0	7.9
1	Royal Worcester Complete Ration . . . . .	J. B. Garland & Son . . . . .	20.5	20.0	8.8		4.2	3.0	50.0	9.1	10.0	7.4
1	Eventually Gold Medal Dairy Ration . . . . .	General Mills, Inc. . . . .	22.4	20.0	8.0		4.8	4.5	49.3	7.7	8.5	7.8
4	Grandin's 24% Balanced Dairy Ration . . . . .	D. H. Grandin Milling Co. . . . .	25.5	24.0	7.9		5.9	5.0	44.5	7.8	10.0	8.4
3	Grandin's Sweetened 24% Dairy Feed . . . . .	D. H. Grandin Milling Co. . . . .	26.6	24.0	9.7		4.4	4.0	44.1	7.3	10.0	7.9
1	Grandin's Sweetened 12 Twin Six 12 Dairy Feed . . . . .	D. H. Grandin Milling Co. . . . .	24.1	22.0	8.3		4.6	5.0	44.5	7.3	12.0	11.2
4	Grandin's 12 Twin Six 12 Dairy Feed . . . . .	D. H. Grandin Milling Co. . . . .	25.2	22.0	8.3		5.7	5.0	45.6	8.2	12.0	7.0
1	Grandin's Milk Maker . . . . .	D. H. Grandin Milling Co. . . . .	22.2	20.0	10.0		3.4	3.0	47.2	8.3	12.0	8.9
1	Grandin's Sweetened 20% Dairy Feed . . . . .	D. H. Grandin Milling Co. . . . .	22.6	20.0	8.7		4.4	4.0	48.6	7.1	10.0	7.3
1	M-S (Money Saver) 20% Sweet Dairy Feed . . . . .	D. H. Grandin Milling Co. . . . .	23.2	20.0	8.7		3.9	4.0	45.8	10.1	12.0	8.3
2	M-S (Money Saver) 16% Sweet Dairy Feed . . . . .	D. H. Grandin Milling Co. . . . .	19.3	16.0	8.2		3.7	4.0	49.2	10.1	12.0	9.5
2	Welcome Dairy Feed . . . . .	D. Harbeck . . . . .	25.7	20.0	8.8		4.4	4.0	50.3	6.4	10.0	4.4
2	Hodgkins' Dairy Ration . . . . .	D. B. Hodgkins' Sons . . . . .	21.9	19.0	8.8		4.5	4.5	50.6	7.8	10.0	6.4
1	Wantmore 24% Sweetened Dairy Ration . . . . .	Horvitz Grain Co. . . . .	23.1	24.0	11.1		4.1	3.5	49.6	5.5	9.0	6.6
2	Wantmore Dairy Ration . . . . .	Horvitz Grain Co. . . . .	24.6	20.0	9.1		5.0	4.0	46.8	7.9	10.0	6.6
2	Wantmore Dairy Ration with Beet Pulp . . . . .	Horvitz Grain Co. . . . .	22.0	20.0	9.4		4.4	4.0	49.1	8.8	10.0	6.3
2	Jaquith & Co. Dairy Ration . . . . .	Jaquith & Co. . . . .	19.9	20.0	10.3		4.1	4.0	52.0	7.8	8.0	5.9
1	Just Right Dairy Ration 20% . . . . .	Jersee Co. . . . .	21.3	20.0	8.2		4.7	4.5	51.5	7.8	10.0	6.5
1	Beatsall Milk Grains . . . . .	Kasco Mills, Inc. . . . .	26.2	22.0	8.5		4.0	4.0	46.6	9.0	10.0	6.7
9	Larroe's 16 Dairy Feed . . . . .	Larroe Milling Co. . . . .	21.6	20.0	8.6		3.8	3.75	49.9	9.9	12.0	6.2
2	Larroe's Cow-Ration . . . . .	Larroe Milling Co. . . . .	18.9	16.0	8.5		3.5	3.0	53.8	9.9	11.0	5.4
3	Maasfield Dairy Feed . . . . .	Mansfield Milling Co. . . . .	20.8	20.0	9.7		4.4	4.0	53.2	6.7	9.0	5.2
2	B-B Hi-Test Dairy Feed 24% Pro. Sweet- ened . . . . .	Mansfield Milling Co. . . . .	24.2	24.0	9.6		4.4	4.0	46.0	9.0	12.0	6.8
1	Sweetened 3 Dollar Maker 20% Protein Dairy Feed . . . . .	Maritime Milling Co., Inc. . . . .	22.2	20.0	8.3		4.3	3.5	49.8	8.5	12.0	6.9

[illegible]

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 II. PREPARED FEEDS — Continued.  
 (a) Protein Feeds — Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.		Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Dairy and Molasses Feeds (more than 15 per cent protein) — Concluded.</b>											
1	E-Ge Dairy Feed	Tioga-Empire Feed Mills, Inc.	8.2	20.0	22.6	20.0	4.4	3.5	49.5	8.4	10.0	6.9
1	Special Open Formula Dairy Ration 20%	Tioga-Empire Feed Mills, Inc.	8.7	22.1	22.1	20.0	4.7	4.5	51.1	7.4	8.0	6.0
1	United Farmers Milk Pep	United Cooperative Farmers, Inc.	8.3	27.1	27.1	24.0	4.6	4.5	44.8	7.2	8.0	8.0
1	United Farmers Milkmaker	United Cooperative Farmers, Inc.	8.7	22.9	22.9	20.0	4.9	4.0	50.0	6.8	8.0	6.7
1	Paymaster 20% Dairy Ration	Unity Feeds, Inc.	10.5	21.5	21.5	20.0	3.8	4.0	48.8	7.6	9.0	6.8
2	"Made-Right" Balanced Ration	C. P. Washburn Co.	8.6	23.9	23.9	22.0	4.4	5.0	49.1	7.8	10.0	6.2
2	"Made-Right" Sweet Dairy Feed	C. P. Washburn Co.	10.1	21.4	21.4	20.0	4.7	4.0	50.8	7.0	8.0	6.0
2	Galen 24% Dairy Feed	Wayne County Grangers Feed Corp.	8.9	24.4	24.4	24.0	4.4	4.0	46.6	8.5	8.5	7.2
3	"Clyde" 20% Dairy Feed	Wayne County Grangers Feed Corp.	9.1	22.6	22.6	20.0	3.9	4.0	48.1	8.4	8.5	7.9
1	Sweetened 16% Dairy Feed	Wayne County Grangers Feed Corp.	10.6	20.6	20.6	16.0	4.1	4.0	49.6	7.0	12.0	8.1
2	Blue Seal Hom-Mix 24% Dairy Ration	H. K. Webster Co.	8.2	25.3	25.3	24.0	5.8	5.0	45.0	9.0	9.0	6.7
2	Blue Seal Improved Balanced Ration	H. K. Webster Co.	8.7	26.2	26.2	24.0	4.8	4.5	46.0	7.8	8.5	6.5
2	Blue Seal "20" Dairy Ration	H. K. Webster Co.	8.5	23.2	23.2	20.0	4.6	4.5	49.1	7.7	7.5	6.9
2	Blue Seal Special 20% Dairy Ration	H. K. Webster Co.	8.8	21.9	21.9	20.0	5.1	4.5	44.7	11.4	10.0	8.1
1	Special 24% Dairy Ration	West-Nesbitt, Inc.	8.0	25.6	25.6	24.0	3.8	3.5	47.7	10.1	12.0	4.8
2	Super Pure Sweet Feed Dairy Ration	West-Nesbitt, Inc.	8.5	26.8	26.8	24.0	4.1	4.5	46.6	6.8	10.0	7.2
2	All Pure 20% Milk Ration	West-Nesbitt, Inc.	9.5	23.6	23.6	20.0	4.2	4.5	49.0	7.3	10.0	6.4
2	Pure Feed Dairy Ration	West-Nesbitt, Inc.	8.4	23.3	23.3	20.0	4.2	4.0	48.5	8.0	10.0	7.6
1	Special 20% Dairy Ration	West-Nesbitt, Inc.	7.9	23.0	23.0	20.0	3.3	3.0	49.5	10.6	12.0	5.7
1	Uniform Sweet Dairy Ration	West-Nesbitt, Inc.	8.5	18.1	18.1	16.0	3.0	3.0	53.1	12.1	14.0	5.2
2	Williams Balanced Ration	Est. M. G. Williams	9.0	21.8	21.8	20.0	4.6	4.0	50.8	7.5	12.0	6.3
2	Bliss Dairy Ration	Stanley Wood Grain Co.	8.7	23.3	23.3	22.0	4.3	5.0	50.4	6.5	10.0	6.8
2	Woods Dairy Ration	Stanley Wood Grain Co.	9.1	20.1	20.1	20.0	4.2	5.0	51.3	7.6	10.0	7.7
	<b>Hog Feeds.</b>											
2	Eastern States Hog Meal	Eastern States Farmers' Exchange	9.2	15.7	15.7	14.5	4.5	4.0	61.5	2.8	5.5	6.3
1	Go-Tu-It Pig & Hog Ration	Park & Pollard Co.	8.6	16.2	16.2	15.0	5.1	3.5	55.6	6.5	8.0	8.0
	<b>Calf Meals.</b>											
3	Wayne Calf Meal	Allied Mills, Inc.	8.5	26.0	26.0	24.0	5.1	4.0	47.0	5.5	7.0	7.9

4	Eastern States Calf Starter	Eastern States Farmers' Exchange	26.1	23.0	5.3	3.5	51.3	3.4	4.0	5.3
2	Eshelman Red Rose Calf Starter	John W. Eshelman & Sons	23.6	20.0	4.8	3.0	53.9	4.4	5.0	5.0
4	Purina Calf Starting Chow	Ralston Purina Co.	8.8	23.0	4.2	3.2	50.2	4.6	7.0	7.4
1	Tioga Calf Food	Tioga-Empire Feed Mills, Inc.	26.6	21.0	4.9	4.0	48.2	4.2	7.0	7.7

## (b) Starchy Feeds.

Fitting Rations.											
3	Wayne Amco 12 <sup>1</sup> / <sub>2</sub> Fitting Ration	Allied Mills, Inc.	8.4	13.8	12.0	4.9	3.0	60.5	5.6	9.0	6.8
1	Bailey's Pasture Ration	E. W. Bailey & Co.	9.2	16.5	15.5	3.9	3.75	53.5	9.9	10.0	7.0
5	Eastern States Fitting Ration	Eastern States Farmers' Exchange	9.1	14.3	12.0	4.1	3.5	61.5	5.7	7.0	5.3
1	Eastern States Highland 12	Eastern States Farmers' Exchange	8.0	16.1	12.0	4.4	3.5	56.4	8.5	10.5	6.6
2	Flory's Certified Fitting Ration	Flory Milling Co., Inc.	9.6	15.6	12.0	4.9	3.5	57.7	6.9	11.0	5.2
2	Purina Fitting Chow	Ralston Purina Co.	8.8	17.5	13.5	3.8	2.6	53.3	9.8	12.0	6.8
4	Purina Heifer Growing Chow	Ralston Purina Co.	9.6	17.6	14.0	3.6	2.5	53.0	8.8	14.0	7.4
4	Utility Pasture Ration	St. Albans Grain Co.	8.7	17.2	14.0	3.4	3.0	50.8	13.1	13.0	6.8
1	Wirthmore 14 Fitting Ration	St. Albans Grain Co.	9.8	18.4	14.0	4.8	4.0	55.3	6.3	7.0	5.4
3	Hygrade Fitting Ration	St. Albans Grain Co.	9.7	14.8	12.0	4.4	4.5	59.8	5.1	8.0	6.2
Stock Feeds.											
4	Empire Stock Feed	Allied Mills, Inc.	9.5	11.4	9.0	3.7	3.0	60.8	7.4	12.0	7.2
1	Sweetened with Molasses Pennant Stock Feed	E. W. Bailey & Co.	8.0	11.2	9.5	5.6	4.0	62.6	8.0	9.5	4.6
2	Conroy's Stock Feed	Nicholas Conroy	9.8	16.9	10.0	4.8	3.0	57.0	6.3	12.0	5.2
4	Coweco Stock Feed	E. A. Cowee Co.	8.5	10.6	9.0	5.2	4.0	60.0	19.5	11.0	5.2
2	Crystal Stock Feed	Curley Brothers	8.5	13.4	12.0	4.0	4.0	55.1	12.0	12.0	7.0
2	Premier Stock Feed	Curley Brothers	8.6	10.8	9.0	4.1	4.5	59.8	10.7	13.5	6.0
2	King Stock Feed	Cutler Co.	7.8	11.1	9.0	5.6	4.0	60.8	8.5	9.5	6.2
2	Delaware Stock Feed	Delaware Mills, Inc.	7.4	11.0	9.0	3.6	3.0	58.0	14.2	12.0	5.8
1	Frederick Stock Feed	Dietrich & Gambrell, Inc.	9.5	12.0	7.5	3.7	3.0	60.4	10.1	12.0	4.3
4	Elmore Stock Feed	Elmore Milling Co., Inc.	7.5	10.5	10.0	4.9	3.0	61.3	11.3	12.0	4.5
1	Red Rose Stock Feed	John W. Eshelman & Sons	8.5	11.3	9.0	5.3	3.0	59.0	10.4	11.0	5.5
4	Quality Stock Feed	Farm Service Stores, Inc.	8.6	10.4	9.0	3.7	3.0	59.9	12.5	12.0	4.9
1	Record Stock Feed	Flory Milling Co., Inc.	11.3	11.2	9.0	3.4	3.5	56.4	11.1	12.0	6.6
1	Garland's HiCarbo Ration	J. B. Garland & Son	7.9	8.4	7.0	2.8	2.0	57.4	17.1	17.0	6.4
4	Grandin's Stock Food	D. H. Grandin Milling Co.	8.1	10.8	8.5	5.5	4.0	60.4	10.6	12.0	4.6
2	B B Bull Brand Stock Feed	Maritime Milling Co., Inc.	9.0	11.0	9.0	3.8	3.5	59.7	10.1	12.0	4.4
1	Hi-Test Stock Feed Sweetened	Maritime Milling Co., Inc.	9.8	9.1	9.0	3.7	3.0	62.9	8.9	12.0	5.6
6	Moon's Stock Feed	Geo. Q. Moon & Co., Inc.	8.5	11.2	9.0	5.0	3.0	59.6	11.0	12.0	4.7
3	P & P Stock Feed	Park & Pollard Co.	8.2	10.6	8.5	5.1	4.0	60.7	9.6	12.0	5.8
3	Quaker Sugared Schumacker Feed	Quaker Oats Co.	8.0	11.7	10.0	4.1	3.0	59.7	10.4	12.0	6.1
13	Wirthmore Stock Feed	St. Albans Grain Co.	8.8	10.3	9.0	5.6	4.0	60.4	8.9	9.5	6.0
1	Unity Stock Feed	Unity Feeds, Inc.	7.3	19.2	8.5	5.3	4.0	61.7	10.6	12.0	4.9



## III. POULTRY FEEDS

		Nowak Milling Corp.		9.2	12.0	9.5	3.1	3.0	66.6	5.2	9.0	3.6
2	Domino Vin-O-Iene Horse Feed	Park & Pollard Co.	.	9.9	13.8	10.0	3.9	3.5	60.7	6.9	9.0	4.8
3	Park & Pollard Horse Feed	Quaker Oats Co.	.	9.7	12.7	10.5	3.5	3.5	64.4	5.9	9.0	3.5
3	Yankee Horse Feed	Quaker Oats Co.	.	9.9	12.5	10.5	3.5	3.5	64.5	5.5	8.0	4.1
1	Quaker Thorobred Horse Feed	Ralston Purina Co.	.	8.2	12.7	10.0	3.8	3.2	63.4	7.4	11.0	4.4
1	Purina Bulky Omolene	Ralston Purina Co.	.	10.0	12.4	10.0	3.8	3.2	63.0	6.9	9.0	3.9
1	Purina Omolene	Ralston Purina Co.	.	9.4	12.5	9.0	2.5	1.3	55.6	12.2	15.0	7.8
3	Purina Bulky Las Chow	Ralston Purina Co.	.	7.6	8.3	5.5	2.7	1.5	56.3	17.6	20.0	7.5
2	Protina Sweet Feed "C"	St. Albans Grain Co.	.	9.5	13.9	10.0	3.1	3.0	54.9	10.8	15.0	7.8
2	Wirthmore Fodder Greens	St. Albans Grain Co.	.	10.2	11.9	9.8	3.8	3.25	65.0	5.9	9.0	3.2
3	Wirthmore Horse Feed	St. Albans Grain Co.	.	9.7	10.9	9.5	3.7	3.25	67.1	4.7	9.0	3.0
7	Hygrade Horse Feed	Tiogua-Empire Feed Mills, Inc.	.	10.9	12.4	10.0	3.8	3.5	62.4	6.1	10.0	4.4
2	Neverfail Horse Feed	Unity Feeds, Inc.	.	9.1	12.3	10.0	3.7	3.5	64.6	6.3	9.0	3.7
1	Unity Horse Feed	Wayne County Grangers Feed Corp.	.	10.0	11.2	10.0	3.2	3.0	67.9	4.8	9.0	2.9
1	Universal Horse Feed	H. K. Webster Co.	.	9.7	11.8	10.5	4.1	3.5	63.1	5.2	7.5	6.1
2	Blue Seal Horse Feed	West-Nesbitt, Inc.	.	10.4	13.1	9.0	3.2	3.0	59.6	9.2	10.0	4.2
3	Pure Feed Horse Ration		.									
Miscellaneous Feeds.												
2	Ground Oats & Banner Feed	F. Diehl & Son, Inc.	.	7.3	13.8	6.0	3.9	2.0	58.8	11.8	30.0	4.4
4	Banner Feed	Quaker Oats Co.	.	6.0	15.1	13.0	4.5	4.5	51.2	17.0	18.0	6.2
2	"Made-Right" Mixed Feed.	C. P. Washburn Co.	.	10.2	17.7	15.0	4.5	4.0	56.1	7.0	8.0	4.5
Alfalfa Leaf Meal.												
2	Alfalfa Leaf Meal	A. B. Caple Co.	.	9.4	18.7	20.0	2.8	2.5	44.0	15.4	18.0	9.7
1	Alfalfa Leaf Meal (Leafalfa Brand)	Denver Alfalfa Milling & Products Co.	.	7.5	20.3	20.0	2.5	1.5	40.5	17.2	18.0	11.5
1	Fernando Ideal Greens Suncured	Fernando Valley Milling & Supply Co.	.	8.4	21.0	20.0	2.4	3.0	38.9	17.8	18.0	11.5
1	Peevee Alfalfa Leaf Meal	Pecos Valley Alfalfa Mill Co.	.	8.6	22.0	20.0	2.9	2.5	39.0	16.5	18.0	11.0
Alfalfa Meal.												
2	Alfalfa Meal	Allied Mills, Inc.	.	7.3	16.3	13.5	2.2	1.5	39.2	25.5	35.0	9.5
1	Beacon Rabbit Alfalfa (cut)	Beacon Milling Co., Inc.	.	6.6	18.0	13.0	2.2	1.0	39.0	20.8	33.0	13.4
5	Alfalfa Meal	A. B. Caple Co.	.	8.2	15.1	13.0	2.0	1.0	40.2	27.1	33.0	7.4
1	Alfalfa Stem Meal	A. B. Caple Co.	.	9.2	17.2	9.0	2.5	0.8	38.7	25.9	40.0	6.5
1	D X Alfalfa Meal	Denver Alfalfa Milling & Products Co.	.	6.8	17.6	15.0	1.8	1.5	38.4	26.3	28.0	9.1
2	Alfalfa Meal	Denver Alfalfa Milling & Products Co.	.	8.5	15.3	13.0	1.7	1.0	39.2	26.9	33.0	8.4
3	Fernando Ideal Greens Suncured	Denver Alfalfa Milling & Supply Co.	.	6.9	20.3	20.0	2.3	3.0	40.0	19.3	18.0	11.2
1	Fernando Alfalfa Meal Fine Ground	Fernando Valley Milling & Supply Co.	.	8.3	17.6	17.0	2.1	2.0	36.6	24.9	25.0	10.5
1	*Grandin's Poultry Green Food	Fernando Valley Milling & Supply Co.	.	8.3	17.6	17.0	2.1	2.0	36.6	24.9	25.0	10.5
2	Green Acres Brand Super-Quality Alfalfa Meal	D. H. Grandin Milling Co.	.	9.7	12.9	19.0	1.6	1.0	49.2	19.3	25.0	7.3
6	California Alfalfa Leaf Meal	Green Acre Farms	.	6.6	17.8	17.0	2.5	2.0	34.8	29.0	25.0	9.8
3	Peevee Alfalfa Leaf Meal	National Mineral Products Co., Ltd.	.	7.9	21.1	20.0	2.2	1.5	39.8	19.3	18.0	9.7
		Pecos Valley Alfalfa Mill Co.	.	5.8	20.3	20.0	2.4	2.5	38.8	19.4	18.0	12.3

\* Alfalfa, beet pulp and molasses.

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
Feeding Oat Meal.											
2	Feeding Oat Meal.	Checkerboard Elevator Co.	7.6	16.5	15.0	6.1	5.0	64.6	2.8	3.7	2.4
1	Gold Medal Fine Ground Feeding Oat Meal	Northern Illinois Cereal Co.	9.1	17.7	15.0	5.6	6.5	60.4	4.4	3.0	2.8
1	Pratt's Ground Oat Groats	Pratt Food Co., Inc.	8.8	18.4	15.0	6.3	5.0	62.0	2.5	3.0	2.0
1	North Star Oatmeal	Quaker Oats Co.	8.1	17.2	16.0	5.8	6.0	64.6	2.1	3.5	2.2
2	Oat Middlings	Robin Hood Mills, Ltd.	8.5	19.0	16.0	9.1	6.0	58.4	2.5	4.0	2.5
4	Red 3 Feeding Oatmeal	Three Minute Cereals Co.	8.5	18.0	14.5	5.5	5.0	61.8	3.4	3.7	2.8
1	Feeding Oatmeal	Western Canada Flour Mills Co., Ltd.	7.8	19.4	13.0	8.9	6.0	58.8	2.8	4.0	2.3
Chick Starting and Growing Feeds.											
3	Wayne Chick Starter	Allied Mills, Inc.	9.4	18.6	17.0	5.5	4.0	53.7	4.9	6.0	7.9
3	Empire Growing Mash	Allied Mills, Inc.	8.8	17.6	16.0	6.0	3.0	56.1	5.1	7.0	6.4
2	Empire Starter & Grower with Sardine Oil	Allied Mills, Inc.	9.2	17.6	16.0	5.7	3.5	54.8	5.2	6.0	7.5
2	Wayne Growing Mash	Allied Mills, Inc.	9.2	18.4	16.0	5.8	4.0	53.7	4.5	6.0	8.4
2	Ames Starter and Broiler Ration	A. P. Ames Co.	8.7	18.7	17.5	4.0	4.0	57.7	4.7	5.0	6.0
2	Ames Growing Mash	A. P. Ames Co.	8.7	18.0	17.0	4.9	4.5	54.6	5.3	6.0	8.5
1	Arcady-Wonder Complete All Mash Chick Starter	Arcady Farms Milling Co.	8.3	18.8	17.0	5.3	5.0	54.6	4.8	5.0	8.2
2	Arcady Beshet Growing Mash	Arcady Farms Milling Co.	8.9	17.1	16.0	5.4	4.0	53.1	6.2	7.5	9.3
2	Beacon Complete Starting Ration	Beacon Milling Co., Inc.	8.6	18.9	17.5	5.1	4.0	54.6	4.9	6.0	7.9
2	Beacon Growing Mash	Beacon Milling Co., Inc.	8.4	19.7	17.0	5.6	4.0	50.3	5.4	7.0	10.6
1	Borden's Chick Starting Feed	Borden Grain Co.	9.0	21.6	17.0	4.6	4.0	49.6	4.6	6.0	10.6
1	Community Chick Mash (Starter-Grower-Broiler)	Community Feed Stores, Inc.	8.0	19.6	17.0	5.4	5.0	55.9	4.5	8.0	6.6
1	Courcy's Growing Feed	Nicolas Courcy	9.8	18.3	17.0	4.6	4.0	57.0	4.7	5.0	5.6
2	Coweco Starting Mash	E. A. Cowee Co.	8.0	20.0	17.0	5.7	4.5	51.3	5.0	6.0	10.0
3	Coweco Growing Mash	E. A. Cowee Co.	8.2	19.5	14.0	6.2	4.5	49.7	6.3	6.0	10.1
1	Crystal Growing Mash	Curley Brothers	8.8	16.3	16.0	4.2	5.0	60.5	2.9	5.0	6.3
1	Crystal Starting Food for Broilers	Curley Brothers	8.4	19.0	16.0	5.0	4.0	55.6	4.2	4.5	7.8
1	Crystal All Grain Starting Food (Cod Liver Oil)	Curley Brothers	8.7	17.6	15.0	4.4	5.0	60.1	3.2	4.0	6.0
1	King Complete Chick & Broiler Ration	Cutler Co.	8.1	21.0	17.5	5.1	4.0	53.7	4.9	5.5	6.9
1	King Growing Feed	Cutler Co.	8.4	17.8	15.0	5.0	4.5	56.5	5.6	6.0	6.7
1	Delaware Growing Mash	Delaware Mills, Inc.	8.7	21.4	17.0	3.7	5.0	49.6	5.4	6.0	9.2
2	Diauto's Fancy Chick Growing Mash	Frank Diauto	7.9	20.5	20.0	5.8	4.0	51.4	4.9	5.0	9.5



	All Mash Starter & Grower	Dietrich & Gambrell, Inc.	6.1	4.0	59.5	3.8	4.0	5.5
1	Special Growing Feed . . . . .	Eastern States Farmers' Exchange, Inc.	14.0	4.9	55.7	5.6	7.0	5.5
1	Eastern States Developer . . . . .	Eastern States Farmers' Exchange .	13.0	5.2	53.7	5.0	6.5	6.7
1	Eastern States Starting and Broiler Ration	John W. Eshelman & Sons . . . . .	18.5	4.7	55.0	3.8	5.0	7.2
3	Eshelman Red Rose Growing Mash . . .	Farm Service Stores, Inc. . . . .	16.0	6.1	53.7	6.1	7.0	6.7
2	North Star Growing Mash . . . . .	Flory Milling Co., Inc. . . . .	16.0	4.9	49.0	5.6	7.0	19.1
1	Flory's "All-Mash," Chick Starter . . . .	Flory Milling Co., Inc. . . . .	17.5	5.6	51.8	6.0	5.0	8.7
1	Flory's "All-Mash," Growing Ration . .	Frederick A. Fountain . . . . .	18.6	17.0	53.1	5.2	7.0	7.4
1	Fountain's Buttermilk Starting Feed . . .	J. B. Garland & Son . . . . .	17.0	5.3	53.7	4.8	6.0	6.8
1	Garland's Fancy Chick Mash . . . . .	General Mills, Inc. . . . .	18.9	17.4	54.2	4.5	8.0	8.4
1	Eventually Gold Medal Growing Mash .	General Mills, Inc. . . . .	17.0	5.2	54.9	5.4	7.5	8.2
2	Eventually Gold Medal Chick Ration . . .	Goode Grain Co. . . . .	16.0	5.2	54.9	5.4	7.5	8.2
1	Complete All Mash Starting & Broiler Feed, U. S. D. A. Formula . . . . .	Goode Grain Co. . . . .	15.5	4.6	55.6	4.3	6.0	8.3
1	Starting & Growing Mash, New England Conference Formula . . . . .	Goode Grain Co. . . . .	17.0	5.2	51.2	4.7	8.0	11.5
2	Goode Starting & Growing Mash . . . .	Goode Grain Co. . . . .	17.0	5.2	49.8	6.0	6.5	11.1
1	Grandin's Combined Chick & Broiler Ration	D. H. Grandin Milling Co. . . . .	16.0	5.6	49.6	6.6	7.0	11.2
1	Grandin's Growing Mash with Buttermilk	D. H. Grandin Milling Co. . . . .	17.7	5.5	56.4	4.1	6.0	6.3
3	Grandin's Growing Mash with Buttermilk- Cod Liver Oil . . . . .	D. H. Grandin Milling Co. . . . .	15.0	5.3	50.4	5.7	8.0	11.9
1	Daily Growth Growing Mash . . . . .	Great Atlantic & Pacific Tea Co. Jaquith & Co. . . . .	15.0	5.4	51.4	5.8	8.0	11.3
2	Just Right Growing Mash . . . . .	Kasco Mills, Inc. . . . .	17.5	5.1	51.1	6.2	7.0	9.4
2	Apex Complete Growing Mash . . . . .	Kasco Mills, Inc. . . . .	16.0	5.2	50.4	5.3	6.0	6.0
2	Kasco All Mash Chick Feed . . . . .	Larroe Milling Co. . . . .	17.0	4.8	53.7	6.4	6.0	8.0
2	Kasco All Mash Growing Food . . . . .	Larroe Milling Co. . . . .	14.0	5.9	53.9	5.3	8.5	8.4
1	Larro Chick Starter . . . . .	Mansfield Milling Co. . . . .	17.0	5.2	54.4	4.4	5.5	6.3
1	Larro Growing Mash . . . . .	Geo. Q. Moon & Co., Inc. . . . .	16.5	4.8	58.5	4.4	5.5	7.2
2	"Mansfield," Chick-Growing Feed . . . .	Geo. Q. Moon & Co., Inc. . . . .	19.7	5.2	53.8	6.2	7.5	8.4
1	Moon's Growing Mash . . . . .	Ogden Grain Co. . . . .	17.0	5.0	50.0	5.8	7.0	13.6
1	Moon's Baby Chick Starter Mash . . . .	Park & Pollard Co. . . . .	15.0	4.1	59.2	3.0	5.0	7.5
1	Thrifty Starting and Growing Mash . .	H. C. Puffer Co. . . . .	17.0	4.8	53.6	5.6	7.0	7.5
1	Manatur Growing Feed . . . . .	Quaker Oats Co. . . . .	15.0	5.7	56.1	6.5	7.0	7.1
3	Park & Pollard Growing Feed . . . . .	Ralston Purina Co. . . . .	14.0	4.9	54.5	4.8	7.0	8.0
3	Egg-Em-On Growing Feed . . . . .	Ralston Purina Co. . . . .	16.0	5.3	54.5	4.8	7.0	7.2
1	Egg-Em-On Starting Mash . . . . .	Quaker Oats Co. . . . .	18.1	5.5	56.3	4.1	6.0	7.0
1	Quaker Ful-O-Pep Growing Mash . . . .	Quaker Oats Co. . . . .	16.0	5.5	56.3	4.1	6.0	7.0
1	Purina Chick Startena (Complete)—All Mash) . . . . .	Ralston Purina Co. . . . .	19.0	6.3	54.1	4.4	6.0	6.8
3	Purina Chick Startena (Complete)—All Mash) . . . . .	Ralston Purina Co. . . . .	18.0	5.4	52.3	4.9	7.0	7.7
1	Purina Growing Chow . . . . .	Ralston Purina Co. . . . .	17.0	5.2	53.6	5.8	7.0	8.2
3	Purina Chick Growena (Complete)—All Mash) . . . . .	Ralston Purina Co. . . . .	15.0	5.4	56.1	5.9	7.0	6.4



Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Chick Starting and Growing Feeds—Concluded.</b>										
2	Minor Chick Mash, Starting and Growing Feed	Ryther & Warren	8.3	20.0	17.0	4.7	4.0	54.5	4.5	6.0	8.0
1	Wirthmore Baby Chick Starter	St. Albans Grain Co.	9.5	18.2	18.0	4.9	4.0	56.4	4.1	5.0	6.9
1	Wirthmore Complete Chick & Broiler Ration	St. Albans Grain Co.	8.8	19.9	17.5	4.8	4.0	54.6	4.8	5.5	7.1
2	Wirthmore Complete Growing Ration	St. Albans Grain Co.	9.7	15.1	14.0	4.4	3.75	53.8	5.1	6.0	5.9
1	"Made Right" Starting & Growing Feed	C. P. Washburn Co.	9.5	20.1	20.0	5.4	5.0	52.8	5.0	5.0	7.2
1	Superior Growing Mash	Wayne County Grangers Feed Corp.	8.0	19.1	18.0	6.0	4.0	50.0	4.9	7.0	12.0
1	Blue Seal Complete Starting Ration	H. K. Webster Co.	8.5	19.6	18.5	4.2	4.0	56.6	4.2	4.5	6.9
2	Blue Seal Chick Starter	H. K. Webster Co.	8.6	19.4	17.5	5.0	4.0	53.3	5.7	6.0	8.0
2	Blue Seal Growing Mash	H. K. Webster Co.	9.2	19.9	17.0	4.4	4.0	51.8	6.1	6.5	8.6
2	Williams' Starter & Growing Feed	Est. M. G. Williams	8.8	19.2	15.0	4.7	4.0	53.8	5.0	7.0	8.5
	<b>Laying Mash.</b>										
2	Wayne 26% Mash Supplement	Allied Mills, Inc.	7.5	27.9	26.0	5.2	4.0	35.4	7.4	10.0	16.6
2	Wayne Breeder Mash	Allied Mills, Inc.	8.6	20.8	18.0	6.1	4.0	47.9	6.8	7.0	10.0
3	Wayne Egg Mash	Allied Mills, Inc.	8.8	20.7	18.0	6.2	3.5	49.6	5.8	7.0	8.9
1	Wayne Egg Mash with Sardine Oil	Allied Mills, Inc.	9.2	19.1	18.0	6.4	3.5	51.2	5.9	7.0	8.2
3	Empire Egg Mash	Allied Mills, Inc.	9.1	18.3	16.5	5.8	3.5	54.3	5.2	7.0	7.3
2	Empire Egg Mash with Sardine Oil	Allied Mills, Inc.	8.9	18.1	16.5	6.3	3.5	55.2	5.3	7.0	6.2
2	Wayne All Mash Laying Ration	Allied Mills, Inc.	9.4	16.8	15.5	4.8	3.5	57.0	5.3	7.0	6.7
2	Ames Egg Mash	A. P. Ames Co.	8.7	21.3	20.0	5.4	5.0	48.0	5.1	5.0	11.5
1	Arcady Beshet Laying Mash	Arcady Farms Milling Co.	9.2	21.3	20.0	5.8	4.0	49.0	5.4	7.0	9.3
1	Sunkist Egg Mash	Arcady Farms Milling Co.	7.0	19.1	18.0	5.1	4.5	52.1	7.2	8.0	9.5
1	Beacon Egg Mash	Beacon Milling Co., Inc.	8.0	23.3	22.0	5.9	4.5	45.2	5.6	7.0	12.0
1	Beacon Breeders Mash	Beacon Milling Co., Inc.	8.3	22.4	20.0	5.4	4.0	46.7	6.1	7.0	11.1
1	Beacon's Cayuga Laying Mash	Beacon Milling Co., Inc.	8.2	21.8	20.0	5.8	4.0	46.4	5.9	7.0	10.9
1	Green Mountain Laying Mash	Perkshire Coal & Grain Co., Inc.	8.0	22.1	19.0	5.7	4.0	45.7	6.7	8.0	11.8
2	Borden's Laying Mash	Borden Grain Co.	9.7	19.3	19.0	5.4	4.5	50.0	5.2	7.0	9.8
2	Brown's Egg Mash	Geo. B. Brown	8.0	18.1	18.0	5.1	5.0	51.2	7.4	10.0	10.2
2	Climax Laying Mash	Putman Feed Co.	9.5	19.8	18.0	5.8	4.0	50.5	6.4	7.0	8.0
1	Community Milk Laying Mash	Community Feed Stores, Inc.	8.3	22.2	20.0	5.8	4.0	48.8	5.9	8.0	9.0

2	Courcy's Eastern Laying Mash	Nicolas Courcy *	8.1	18.3	17.0	4.5	4.0	54.6	4.4	6.0	10.1
2	The Perfect Dry Mash	Cover & Palm Co.	7.8	20.4	15.0	5.2	4.0	49.9	6.4	10.0	10.3
2	Coweco Laying Mash	E. A. Cowee Co.	8.2	24.5	20.0	6.5	4.0	43.6	5.2	7.5	12.0
2	Coweco Sunrise Laying Mash	E. A. Cowee Co.	8.1	20.4	16.0	5.5	3.5	46.6	6.7	8.0	10.7
1	Coweco All Mash Ration	E. A. Cowee Co.	8.6	18.2	15.0	5.3	4.0	53.6	4.1	6.0	12.2
2	Crystal Egg Mash	Curley Brothers	8.1	21.6	18.0	5.0	4.0	50.6	5.1	6.0	9.6
2	King Complete Laying Ration	Cutler Co.	9.6	16.4	15.0	4.5	4.0	58.9	3.6	5.0	7.0
5	Indian Laying Mash	Delaware Mills, Inc.	8.6	20.5	18.0	5.0	5.0	49.8	6.1	7.0	9.4
2	Diauto's Special Egg Mash	Frank Diauto	8.1	19.9	20.0	6.1	4.0	52.7	4.5	7.0	8.7
2	Diehl's Dry Mash	F. Diehl & Sons, Inc.	7.0	25.1	16.0	4.8	3.0	48.3	5.4	12.0	7.9
4	Excel Mash	J. L. Dunnell & Son	8.5	24.2	19.0	4.2	5.0	48.3	3.1	6.0	9.7
1	Special Laying Mash	East Bridgewater Farmers' Exchange, Inc.	9.0	21.2	18.0	5.3	5.0	52.5	4.7	6.0	7.3
3	Eastern States Controller Mash	Eastern States Farmers' Exchange	8.0	20.5	18.5	3.8	2.5	58.4	2.6	4.0	6.7
5	Eastern States Producer 20	Eastern States Farmers' Exchange	7.9	21.7	20.0	5.9	4.0	49.9	5.0	6.0	9.6
8	Eastern States Producer Mash	Eastern States Farmers' Exchange	8.4	19.0	17.0	5.6	4.0	53.6	4.8	6.5	8.6
4	Eastern States Combination Mash	Eastern States Farmers' Exchange	8.3	16.5	15.0	4.8	4.0	59.2	4.8	6.5	8.4
3	The Ellis Poultry Mash	Michael W. Ellis	8.5	22.8	20.0	5.3	4.0	47.2	5.5	8.0	10.7
2	Elmore Egg Mash	Elmore Milling Co., Inc.	8.4	21.9	18.0	5.9	4.0	51.0	4.9	8.0	7.9
2	Elmore Eggmaker	Elmore Milling Co., Inc.	8.2	20.1	17.0	6.1	4.5	52.3	6.0	8.0	7.3
4	Big C Mash	Farm Service Stores, Inc.	9.3	20.6	19.0	4.8	4.5	50.0	5.9	8.0	9.4
2	North Star Laying Mash	Farm Service Stores, Inc.	8.7	22.5	18.0	5.0	4.0	46.0	5.9	6.5	11.9
1	Service Egg Mash (Complete)	Farm Service Stores, Inc.	7.9	19.0	16.0	5.1	4.0	55.4	3.8	5.5	8.8
2	Golden Egg Laying Mash	Farm Service Stores, Inc.	8.4	20.6	20.0	5.8	4.0	48.2	7.6	7.0	9.4
2	Sunray Laying Mash	Flory Milling Co., Inc.	9.0	19.4	18.0	6.0	4.0	46.7	7.7	10.0	11.2
2	Flory's Blue Seal "All-Mash" Laying Ration	Flory Milling Co., Inc.	9.7	17.1	15.0	5.5	4.5	53.3	7.0	7.0	7.4
2	Fountain's Buttermilk Laying Mash	Fred A. Fountain	8.8	21.2	17.0	4.9	4.5	51.4	4.5	7.0	9.2
1	Special Poultry Feed	Dean S. French	8.0	20.9	20.0	6.0	4.5	50.0	5.6	9.0	11.5
2	Garland's Economy Egg Mash	J. B. Garland & Son	7.7	18.7	16.0	5.6	4.0	48.0	6.3	7.0	11.1
5	Eventually Gold Medal Egg Mash	General Mills, Inc.	8.2	20.8	19.0	5.3	5.0	49.7	5.2	8.0	10.8
1	Conference Mash	W. K. Gilmore & Sons, Inc.	8.2	18.3	17.0	5.4	4.0	51.5	6.8	6.5	9.8
1	Laying Mash — Mass. Agric. College Formula	Goode Grain Co.	8.6	19.4	17.0	5.0	4.0	49.9	6.4	7.0	10.7
3	Grandin's Laying Mash with Buttermilk	D. H. Grandin Milling Co.	8.4	22.9	20.0	5.4	4.0	41.6	5.7	8.0	13.0
5	Grandin's Laying Mash with Buttermilk—Cod Liver Oil	D. H. Grandin Milling Co.	8.8	23.1	20.0	5.4	4.0	43.6	5.4	8.0	13.7
1	Daily Egg Mash Feed	Great Atlantic & Pacific Tea Co.	7.5	20.5	20.0	5.6	4.5	51.4	4.6	7.0	10.4
1	Welcome Laying Mash	D. Harbeck	7.9	19.4	17.0	5.7	4.0	52.1	5.9	7.0	9.0
2	Hodgkins' Poultry Mash	D. B. Hodgkins' Sons	8.6	21.0	18.0	5.2	5.0	49.0	6.2	8.0	10.0
2	Make-M-Lay Laying Mash	Horvitz Grain Co.	9.0	22.3	20.0	5.3	5.0	46.7	6.8	9.0	9.9
1	Ideal Poultry Mash	R. B. Howlett	8.9	20.8	15.0	5.2	4.0	52.0	5.3	10.0	7.8
2	Jaquith & Co. Laying Mash	Jaquith & Co.	8.5	20.1	17.0	5.2	4.0	53.3	5.6	8.0	7.3
2	Just Right Egg Mash	Jersee Co.	8.9	20.3	18.0	4.8	5.0	49.5	6.9	8.0	9.6
4	Apex Laying Mash	Kasco Mills, Inc.	8.6	21.5	20.0	5.6	4.0	48.3	5.2	8.5	10.8
2	Kasco Poultry Flushing Mash	Kasco Mills, Inc.	9.2	19.0	17.0	5.1	4.0	56.1	4.0	5.5	6.6
1	Kasco All-Mash Laying Food	Kasco Mills, Inc.	8.2	18.2	15.0	5.7	4.0	55.0	5.4	6.0	7.5

Complete Average Analyses of Feed Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Laying Mash</b> es—Concluded.										
3	Larroe Egg Mash	Larroe Milling Co.	8.6	21.0	19.0	4.9	4.0	48.8	6.2	7.5	10.5
3	Mansfield Dry-Poultry Mash	Mansfield Milling Co.	9.0	23.6	22.0	5.8	5.0	48.0	5.0	7.0	8.6
4	Dollar S. Maker Egg Mash	Maritime Milling Co., Inc.	9.0	18.7	17.0	6.6	3.5	49.4	6.8	9.0	9.5
3	Moon's Laying Mash	Geo. Q. Moon & Co., Inc.	8.6	19.3	20.0	5.5	4.0	48.4	4.5	9.0	13.1
2	Moon's Special A Laying Mash	Geo. Q. Moon & Co., Inc.	9.7	19.3	18.0	4.4	5.0	49.0	5.0	9.0	12.6
1	Good Value Laying Mash	Ogden Grain Co.	7.9	19.2	18.5	5.0	4.5	51.9	4.9	7.0	8.1
2	Thrifty Laying Mash	Ogden Grain Co.	8.7	20.7	18.0	5.3	4.0	51.9	4.3	8.0	9.1
2	Bidwell Dry-Mash with Cod Liver Oil	Park & Pollard Co.	8.6	23.6	18.0	5.6	3.0	50.3	6.5	8.0	8.4
2	Lay or Bust Dry-Mash	Park & Pollard Co.	8.7	18.0	18.0	5.1	3.0	52.8	5.5	7.0	9.3
2	Lay or Bust Dry-Mash with Cod Liver Oil	Park & Pollard Co.	8.8	20.9	18.0	5.7	3.0	48.1	5.8	7.0	10.7
2	Manamar Lay or Bust Mash	Park & Pollard Co.	8.6	19.8	18.0	5.3	3.5	49.5	6.9	6.0	9.9
2	Manamar Complete Ration	Park & Pollard Co.	9.1	18.2	16.0	6.1	3.5	53.1	6.1	7.0	7.9
11	Parker's Egg Mash	George H. Parker Grain Co.	8.3	20.3	18.0	6.1	5.0	48.6	6.7	8.0	10.0
2	Pratt's Cak-Cak Egg Mash	Pratt Food Co.	8.3	18.8	18.0	5.7	4.0	53.4	5.9	8.0	6.9
2	Egg-Fm-On Laying Mash	H. C. Puffer Co.	7.2	22.4	20.0	5.1	4.0	49.4	6.5	9.0	8.4
2	Quaker Full-O-Pep Egg Mash	Quaker Oats Co.	7.8	21.8	20.0	7.1	4.5	49.1	5.7	9.0	9.0
1	Purina Egg Chowder	Ralston Purina Co.	8.5	21.2	19.0	5.7	3.5	48.0	6.9	8.0	8.7
2	Purina Egg Chowder	Ralston Purina Co.	8.5	21.9	19.0	5.6	3.5	48.1	6.8	8.0	9.8
4	Purina Lay Chow	Ralston Purina Co.	8.7	20.7	19.0	5.2	3.5	48.2	5.5	8.0	11.3
4	Purina Lay Chow	Ralston Purina Co.	9.5	17.9	15.5	5.6	3.5	53.7	4.5	8.0	9.2
1	Purina Layena (Complete—All Mash)	D. F. Riley	7.6	22.6	20.0	4.7	4.5	51.0	5.1	6.0	9.0
2	Riley's Laying Mash	Reuben W. Ropes	7.7	18.0	17.0	5.5	5.0	52.0	9.0	10.0	7.8
2	Ropes' Poultry Mash	Ryther & Warren	8.4	21.0	18.0	5.9	5.0	49.2	6.2	8.0	9.3
2	Minot Milk Egg Mash	Ryther & Warren	8.5	19.9	17.0	5.9	4.5	52.0	5.2	7.0	9.6
2	Wirthmore Laying Mash	St. Albans Grain Co.	7.7	20.4	20.0	4.9	4.0	52.2	5.2	7.0	9.6
2	Wirthmore Complete Laying Ration	St. Albans Grain Co.	9.1	16.8	15.0	4.7	4.0	50.2	3.6	5.0	6.6
3	Squier's Buttermilk Egg Mash	Squier & Co.	7.5	19.9	18.0	6.2	5.0	52.1	5.4	7.0	8.9
1	Egatine	Tioga-Empire Feed Mills, Inc.	8.7	22.7	23.0	5.1	4.0	50.4	5.2	6.5	7.9
3	Ti-O-Ga Laying Food	Tioga-Empire Feed Mills, Inc.	8.9	21.0	18.0	5.2	4.0	52.9	5.2	6.5	6.8
2	Neverfail Full Feed	Tioga-Empire Feed Mills, Inc.	8.4	20.1	17.0	4.7	4.0	55.3	5.0	7.0	6.5
1	United Farmers Milk Egg Mash	United Cooperative Farmers, Inc.	8.4	18.2	16.5	6.1	4.0	52.6	5.1	6.5	9.6
1	Unity Laying Mash	Unity Feeds, Inc.	7.9	20.1	18.0	5.3	3.0	51.6	5.6	7.0	9.5
3	"Made-Right" Dry Mash	C. P. Washburn Co.	9.2	21.0	20.0	5.2	4.5	51.5	5.1	6.0	8.0



Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
<b>Turkey Feeds—Concluded.</b>											
2	Purina Turkey Growing and Fattening Chow	Ralston Purina Co.	8.8	23.8	21.0	5.4	3.5	49.5	5.3	8.0	7.2
1	Wirthmore Turkey Growing Ration	St. Albans Grain Co.	9.5	21.2	20.0	5.7	4.0	49.1	4.7	7.0	9.8
1	Blue Seal Turkey Growing	H. K. Webster Co.	7.6	20.8	20.0	6.0	4.5	46.0	5.6	5.5	11.0
<b>Rabbit Feeds.</b>											
1	Wayne Rabbit Feed	Allied Mills, Inc.	8.8	15.9	13.0	4.1	3.0	56.1	8.8	11.0	6.3
3	D. & G. Rabbit Feed	Dietrich & Gambrell, Inc.	8.7	16.0	12.0	4.6	3.5	60.0	5.1	9.5	5.6
1	Eshelman Red Rose Rabbit Feed	John W. Eshelman & Sons	10.7	14.8	14.0	3.1	3.5	51.6	7.7	9.5	9.1
1	Flory's Rabbit Feed	Flory Milling Co., Inc.	9.3	14.3	13.0	3.7	3.0	58.5	6.7	7.0	7.5
2	Flory's Rabbit Pellets	Flory Milling Co., Inc.	8.4	13.5	12.0	4.1	4.0	59.1	7.3	10.0	7.2
3	Purina Rabbit Chow (Complete Ration)	Ralston Purina Co.	9.1	17.5	13.5	3.1	2.5	54.6	9.4	16.0	6.3

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
IV. ANIMAL PRODUCTS.

Number of Samples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Protein.		Fat.		Phosphoric Acid.	Ash.
			Found.	Guaranteed.	Found.	Guaranteed.		
	<b>Meat.</b>							
3	Corenco 55% Meat Scrap	Consolidated Rendering Co.	60.1	55.0	10.2	6.0	7.8	21.6
2	Morse's 55% Meat Scrap	Jas. F. Morse & Co.	57.4	55.0	9.7	8.0	8.7	23.7
1	Brighton Special Meat Scrap	New England Rendering Co.	60.3	55.0	12.2	8.0	5.7	17.5
1	Brighton Bull Meat Scrap	New England Rendering Co.	53.7	45.0	13.4	8.0	9.4	24.0
1	60% Register Brand Meat Scraps	John Reardon & Sons Co.	61.9	60.0	11.7	6.0	6.5	18.9
1	55% Register Brand Meat Scraps	John Reardon & Sons Co.	55.8	55.0	10.6	6.0	9.8	27.2
1	Stanley's Meat and Bone Scrap	John T. Stanley Co., Inc.	61.5	50.0	7.4	10.0	5.5	15.8
	<b>Meat and Bone.</b>							
7	Corenco 50% Meat and Bone Scrap	Consolidated Rendering Co.	50.8	50.0	10.1	6.0	12.1	31.2
5	Corenco 45% Meat & Bone Scrap	Consolidated Rendering Co.	46.2	45.0	9.0	6.0	14.1	35.7
2	Moran	Monti-Van Iderstine, Inc.	53.2	50.0	10.6	7.0	10.4	28.4
2	Morse's 50% Meat Scraps	Jas. F. Morse & Co.	53.5	50.0	10.3	8.0	11.1	28.6
3	Morse's 45% Meat Scraps	Jas. F. Morse & Co.	46.5	45.0	9.4	8.0	13.5	34.7
5	55% Register Brand Meat Scraps	John Reardon & Sons Co.	52.6	55.0	10.3	6.0	10.5	28.4
2	50% Register Brand Meat and Bone Scraps	John Reardon & Sons Co.	50.7	50.0	9.6	6.0	12.3	31.8
2	45% Register Brand Meat and Bone Scraps	John Reardon & Sons Co.	45.5	45.0	8.6	6.0	14.5	37.9
1	Steamed Meat & Bone	N. Roy & Son	54.1	50.0	10.6	8.0	10.5	25.3
	<b>Bone Meal.</b>							
1	Corenco Bone Meal	Consolidated Rendering Co.	26.7	20.0	5.7	2.0	24.0	58.7
1	Brighton Feeding Bone	New England Rendering Co.	9.8	7.0	1.7	3.0	31.9	78.4
1	Digesta-Bone	Pacific Bone Coal & Fertilizing Co.	5.3	5.0	0.3	—	35.2	88.8
1	Rearco Bone Meal	John Reardon & Sons Co.	29.2	20.0	3.9	3.0	23.3	67.0
	<b>Fish.</b>							
2	Corenco Cod & Haddock Meal	Consolidated Rendering Co.	66.8	62.0	3.5	2.0	8.9	22.6
3	CICO Fish Meal	Consumers Import Co., Inc.	61.3	55.0	6.5	1.0	5.7	17.5
1	Maine Vitamin D Fish Meal	Maine Fish Meal Co.	58.4	55.0	16.5	1.0	5.8	14.9
1	Boston Cod & Haddock Meal	New England Rendering Co.	65.3	62.0	4.8	3.0	9.4	23.2

Complete Average Analyses of Feeds Collected (Per Cent) — Concluded.  
IV. ANIMAL PRODUCTS — Concluded.

Number of Samples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Protein.		Fat.		Phosphoric Acid.	Ash.
			Found.	Guaranteed.	Found.	Guaranteed.		
3	Fish—Concluded.							
1	Register Brand Cod and Haddock Fish Meal	John Reardon & Sons Co.	65.6	60.0	4.3	3.0	9.4	24.0
	Ro-Be Fish Meal	Ronck & Bevis Co.	58.5	55.0	6.8	5.0	—	22.0
	Milk Products.						Milk Sugar by Difference.	
2	Buell-Boston Dried Skim Milk	C. E. Buell, Inc.	35.0	31.0	0.9	0.2	50.9	8.3
1	Vita-Brand Dried Skim Milk	Center Milk Products Co.	33.7	34.0	1.2	1.0	50.1	8.4
4	Dairylea Dried Skim Milk	Dairyman's League Co-operative Assn., Inc.	35.1	33.0	0.8	0.5	50.7	8.3
4	Old Sol Dried Skim Milk	General Commodity Corp.	34.6	32.0	1.6	0.5	49.1	8.5
1	Dried Skim Milk Powder	Queensboro Farm Products, Inc.	34.8	32.0	1.2	0.75	51.0	8.2
1	Dry Skim Milk	United Farmers Co-Operative Creamery Association, Inc.	37.7	32.0	1.1	0.5	47.2	8.8
3	Ward's Dried Skim Milk	Ward Dry Milk Co.	34.2	32.0	1.1	1.0	50.7	7.8

## Summary of Analyses

Season of 1934 - 1935

	Samples.	Brands.	Manu- facturers.
<b>Alfalfa Products</b>			
Alfalfa Meal . . . . .	31	12	9
Alfalfa Leaf Meal . . . . .	5	4	4
<b>Animal and Fish Products</b>			
Bone Meal . . . . .	4	4	4
Fish Meal . . . . .	11	6	6
Meat Scrap . . . . .	10	7	5
Meat and Bone Scrap . . . . .	28	9	5
Milk Powder . . . . .	16	7	7
<b>Brewers By-Products</b>			
Brewers Grains . . . . .	17	4	4
<b>Cereal Meals</b>			
Barley Meal . . . . .	1	1	1
Corn Meal . . . . .	35	—	—
Ground Oats . . . . .	60	—	—
Feeding Oatmeal . . . . .	13	7	7
Provender (Corn and Oats) . . . . .	24	—	—
<b>Corn Products</b>			
Gluten Feed . . . . .	51	9	8
Gluten Meal . . . . .	16	4	4
Hominy Feed . . . . .	36	9	9
<b>Miscellaneous Mill Residues</b>			
Beet Pulp . . . . .	12	2	1
Oat Feed . . . . .	7	4	3
Rye Feed . . . . .	5	2	2
Unclassified . . . . .	8	3	3
<b>Oil Cake Meals</b>			
Soy Bean Meal . . . . .	10	4	4
Cottonseed Meal . . . . .	52	17	9
Linseed Meal . . . . .	26	8	6
<b>Wheat Products</b>			
Red Dog Flour . . . . .	10	6	5
Wheat Flour Middlings . . . . .	11	8	6
Wheat Standard Middlings . . . . .	27	16	16
Wheat Mixed Feed . . . . .	63	19	19
Wheat Bran . . . . .	61	23	23
<b>Mixtures for Animals</b>			
Calf Meals . . . . .	14	5	5
Dairy Feeds . . . . .	377	165	64
Fitting Rations . . . . .	26	10	6
Hog Feeds . . . . .	3	2	2
Molasses Feeds . . . . .	95	40	26
Rabbit Feeds . . . . .	11	5	5
Stock Feeds . . . . .	73	26	24
<b>Mixtures for Poultry</b>			
Chick Growing and Starting Feeds . . . . .	116	71	42
Chick Scratch Feeds . . . . .	7	6	6
Duck Feeds . . . . .	2	2	1
Fattening Feeds . . . . .	17	9	7
Laying Feeds . . . . .	241	104	64
Turkey Feeds . . . . .	19	11	7
Totals . . . . .	1651	651	—



## Feeds Not Conforming to Guarantees.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
5	3	<b>Arcady Farms Milling Co.</b> { Arcady 24% Open Formula Production Ration { Arcady 24% Open Formula Production Ration { Arcady 24% Open Formula Production Ration	— — —	1.4 1.6 1.1	— — —
2	1	<b>Berkshire Coal &amp; Grain Co.</b> Green Mountain Dairy Ration . . . . .	1.5	—	3.9
2	1	<b>Bolduc &amp; Son</b> Octagon Dairy Ration . . . . .	2.3	—	—
4	1	<b>A. B. Caple Co.</b> Alfalfa Leaf Meal . . . . .	3.1	—	—
7	1	<b>Consolidated Rendering Co.</b> Corenco 50% Meat & Bone Scrap . . . . .	1.8	—	—
5	2	{ Corenco 45% Meat & Bone Scrap . . . . . { Corenco 45% Meat & Bone Scrap . . . . .	1.6 2.0	— —	— —
4	1	<b>F. A. Cowee Co.</b> Coweco Stock Feed . . . . .	—	—	1.9
2	2	{ Coweco Sunrise 20% Dairy Ration . . . . . { Coweco Sunrise 20% Dairy Ration . . . . .	1.2 1.5	— —	— —
2	1	<b>Delaware Mills, Inc.</b> Delaware Sweet 24% Dairy Feed . . . . .	—	1.1	—
1	1	Delco 24% Dairy Feed . . . . .	2.1	—	—
3	1	Delco Sweet 20% Dairy Feed . . . . .	—	1.1	—
2	2	{ Delaware Stock Feed . . . . . { Delaware Stock Feed . . . . .	— —	— —	1.4 3.0
2	2	<b>Donahue-Stratton Co.</b> "Hiquality" Brewers Dried Grains . . . . . "Hiquality" Brewers Dried Grains . . . . .	3.5 2.6	— —	— —
4	1	<b>J. L. Dunnell &amp; Son</b> Excel Mash . . . . .	—	1.2	—
2	2	<b>Elmore Milling Co., Inc.</b> Elmore Sweet Digesto Dairy Feed . . . . . Elmore Sweet Digesto Dairy Feed . . . . .	— —	— —	1.7 2.1
1	1	<b>John W. Eshelman &amp; Sons</b> Eshelmans S-O-S . . . . .	—	—	2.0
2	1	<b>Farm Service Stores, Inc.</b> Diamond A Dairy Ration . . . . .	—	1.0	—
5	2	{ Diamond C Dairy Ration . . . . . { Diamond C Dairy Ration . . . . .	— —	1.3 1.1	— —
4	2	{ Quality Stock Feed . . . . . { Quality Stock Feed . . . . .	— —	— —	1.1 1.2
3	2	<b>Fernando Valley Milling &amp; Supply Co.</b> Fernando Ideal Greens Suncured . . . . . Fernando Ideal Greens Suncured . . . . .	— —	— —	1.1 2.2
3	3	<b>Flory Milling Co., Inc.</b> Record Dairy Feed . . . . . Record Dairy Feed . . . . . Record Dairy Feed . . . . .	— — —	1.2 — 1.4	— 1.5 —
1	1	Flory's Spring Pasture . . . . .	—	—	1.8
2	1	Flory's "All-Mash" Chick Starter . . . . .	—	—	1.3
2	2	{ Flory's Turkey Growing Mash . . . . . { Flory's Turkey Growing Mash . . . . .	— —	— —	1.0 1.4
2	2	<b>Green Acre Farms</b> Green Acres Brand Super Quality Alfalfa Meal Green Acres Brand Super Quality Alfalfa Meal	— —	— —	3.8 4.1

## Feeds Not Conforming to Guarantees — Concluded.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
1	1	<b>Hecker-H-O Co., Inc.</b> Oat Mill Feed . . . . .	—	—	1.3
3	1	<b>Jersee Co.</b> Just Right Growing Mash . . . . .	—	—	1.2
2	2	<b>Geo. Q. Moon &amp; Co., Inc.</b> { Moon's 20% Dairy Feed with Molasses . . . . .	—	1.5	—
3	3	{ Moon's 20% Dairy Feed with Molasses . . . . .	—	1.0	2.4
		{ Moon's Horse Feed with Molasses . . . . .	—	—	1.3
		{ Moon's Horse Feed with Molasses . . . . .	—	—	1.5
		{ Moon's Horse Feed with Molasses . . . . .	—	—	2.3
6	4	<b>National Mineral Products Co., Ltd.</b> { California Alfalfa Leaf Meal . . . . .	—	—	1.1
		{ California Alfalfa Leaf Meal . . . . .	—	—	2.1
		{ California Alfalfa Leaf Meal . . . . .	—	—	2.1
		{ California Alfalfa Leaf Meal . . . . .	—	—	1.8
1	1	<b>New England Rendering Co.</b> Brighton Feeding Bone . . . . .	—	1.3	—
1	1	<b>Niagara Falls Milling Co.</b> Choice Wheat Red Dog . . . . .	1.0	—	—
1	1	<b>Northern Illinois Cereal Co.</b> Gold Medal Fine Ground Feeding Oatmeal . . . . .	—	—	1.4
11	3	<b>Park &amp; Pollard Co.</b> { Manamar Complete Ration . . . . .	—	—	1.1
		{ Manamar Complete Ration . . . . .	—	—	1.4
		{ Manamar Complete Ration . . . . .	—	—	1.1
4	2	<b>Pecos Valley Alfalfa Mill Co.</b> { Pecos Alfalfa Leaf Meal . . . . .	1.1	—	2.8
		{ Pecos Alfalfa Leaf Meal . . . . .	—	—	1.2
3	1	<b>John Reardon &amp; Sons Co.</b> 55% Register Brand Meat Scraps . . . . .	3.9	—	—
2	1	<b>R. W. Ropes</b> Ropes Balanced Ration . . . . .	2.4	—	—
2	1	Ropes Sweet Ration . . . . .	1.3	—	—
13	1	<b>St. Albans Grain Co.</b> Wirthmore Stock Feed . . . . .	1.2	—	4.3
1	1	<b>John T. Stanley Co., Inc.</b> Stanley's Meat & Bone Scrap . . . . .	—	2.6	—
2	2	<b>Stratton &amp; Co.</b> { Stratton's Middlings . . . . .	—	1.0	—
		{ Stratton's Middlings . . . . .	—	1.0	—
4	3	<b>Upper Hudson Rye Flour Mills, Inc.</b> { Upper Hudson Rye Feed . . . . .	1.3	—	—
		{ Upper Hudson Rye Feed . . . . .	2.8	—	—
		{ Upper Hudson Rye Feed . . . . .	3.5	—	—
2	1	<b>C. P. Washburn Co.</b> "Made Right" Balanced Ration . . . . .	—	1.1	—
2	2	<b>H. K. Webster Co.</b> { Blue Seal Special 20% Dairy Ration . . . . .	—	—	1.6
		{ Blue Seal Special 20% Dairy Ration . . . . .	—	—	1.1
		{ Blue Seal Stock Feed . . . . .	—	—	1.5
2	2	{ Blue Seal Stock Feed . . . . .	—	—	4.1

## Certified Ingredients.

Allied Mills, Inc.

### Empire 24% Dairy Ration

Corn distillers' dried grains, brewers' dried grains, soybean oil meal, corn gluten feed, corn gluten meal, cottonseed oil meal, corn meal, wheat bran, ground and bolted screenings from flax, wheat, corn, oats and barley, clipped oat by-products, cane molasses, 1% ground limestone and 1% salt.

### Empire 20% Dairy Ration

Corn distillers' dried grains, brewers' dried grains, soybean oil meal, corn gluten feed, corn gluten meal, cottonseed oil meal, corn meal, wheat bran, ground and bolted screenings from flax, wheat, corn, oats and barley, clipped oat by-products, cane molasses, 1% ground limestone and 1% salt.

### Empire 16½% Dairy Ration

Corn distillers' dried grains, brewers' dried grains, soybean oil meal, corn gluten feed, corn gluten meal, cottonseed oil meal, corn meal, wheat bran, ground and bolted screenings from flax, wheat, corn, oats and barley, clipped oat by-products, cane molasses, 1% ground limestone and 1% salt.

### Empire Egg Mash

Dried buttermilk, dried skim milk, meat scraps, soybean oil meal, choice alfalfa meal, wheat bran, wheat standard middlings, corn gluten feed, corn meal, fine ground oats, 1% ground limestone and 1% salt.

### Empire Egg Mash with Sardine Oil

Dried buttermilk, dried skim milk, meat scraps, soybean oil meal, choice alfalfa meal, wheat bran, wheat standard middlings, corn gluten feed, corn meal, fine ground oats, 1% ground limestone, 1% salt and sardine oil.

### Empire Growing Mash

Corn meal, wheat bran, soybean oil meal, fine ground oats, meat scraps, wheat standard middlings, choice alfalfa meal, corn gluten feed, dried skim milk, dried buttermilk, 1% salt and 1% ground limestone.

### Empire Starter & Grower with Sardine Oil

Corn meal, fine ground oats, soybean oil meal, fish meal, meat scraps, wheat standard middlings, wheat bran, choice alfalfa meal, dried skim milk, dried buttermilk, 1.5% ground limestone, 0.04% iron oxide, 0.0005% potassium iodide, 0.25% salt and sardine oil.

### Wayne All Mash Laying Ration

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat flour middlings, wheat bran, corn meal, fine ground oats, choice alfalfa meal, soybean oil meal, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

### Wayne Amco 24% Dairy Ration

Cottonseed meal, corn gluten meal, corn distillers' dried grains, brewers' dried grains, corn gluten feed, old process linseed oil meal, soybean oil meal, peanut oil meal, ground oats, corn meal, wheat bran, cane molasses, 1% steamed bone meal, 1% ground limestone and 1% salt.

### Wayne Amco 20% Dairy Ration

Cottonseed meal, brewers' dried grains, corn distillers' dried grains, ground oats, corn gluten feed, corn meal, soybean oil meal, corn gluten meal, old process linseed oil meal, wheat bran, cane molasses, 1% steamed bone meal, 1% ground limestone and 1% salt.

### Wayne Amco 32% Supplement Dairy Ration

Soybean oil meal, corn gluten meal, corn distillers' dried grains, cottonseed meal, peanut oil meal, corn gluten feed, old process linseed oil meal, wheat bran, cane molasses, 1% steamed bone meal, 2% ground limestone and 1% salt.

### Wayne Breeder Mash

Fish meal, meat scraps, dried buttermilk, dried skim milk, soybean oil meal, choice alfalfa meal, wheat bran, corn meal, corn germ oil meal, wheat standard middlings, fine ground oats, crab meal, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt and sardine oil.

### Wayne Broiler Ration

Dried buttermilk, dried skim milk, meat scraps, fish meal, ground yellow corn, fine ground oats, wheat standard middlings, wheat bran, soybean oil meal, choice alfalfa meal, 1.5% ground limestone, 0.04% iron oxide, 0.0005% potassium iodide, 0.25% salt and sardine oil.

### Wayne Chick Starter

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, choice alfalfa meal, soybean oil meal, wheat bran, 1.5% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

### Wayne Egg Mash

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, wheat bran, corn meal, fine ground oat meal, corn gluten feed, choice alfalfa meal, soybean oil meal, fine ground oats, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

### Wayne Egg Mash with Sardine Oil

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, wheat bran, corn meal, fine ground oat meal, corn gluten feed, choice alfalfa meal, soybean oil meal, fine ground oats, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt and sardine oil.

**Wayne Growing Mash**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, choice alfalfa meal, soybean oil meal, wheat bran, 1.5% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

**Wayne 26% Mash Supplement**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, peanut oil meal, wheat bran, corn gluten meal, corn gluten feed, choice alfalfa meal, soybean oil meal, 3% ground limestone, 0.15% iron oxide, 0.002% potassium iodide and 0.5% salt.

**Wayne Poultry Fattener**

Ground yellow corn, corn germ oil meal, white hominy feed, rolled oats, oat flour, fine ground oats, wheat standard middlings, wheat red dog, old process linseed oil meal, and 1% salt.

**Wayne Turkey Mash**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oats, choice alfalfa meal, soybean oil meal, wheat bran, 1% charcoal, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide and 0.25% salt.

**Wayne 25% Turkey Starting Mash**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, choice alfalfa meal, soybean oil meal, wheat bran, fine ground oats, 1% charcoal, 2% ground limestone, 0.15% iron oxide, 0.002% potassium iodide, 0.5% salt and sardine oil.

**A. P. Ames Co.****20% Balanced Ration**

Corn meal, hominy, wheat bran, wheat middlings, reground oat feed with molasses, gluten feed, linseed meal, cotton seed meal, calcium carbonate, salt, bone meal.

**Ames Complete Starter and Broiler Ration**

Fortified cod liver oil, dried skim milk, oat meal, ground oats, corn meal, wheat bran, wheat middlings, alfalfa meal, meat scraps, fish meal, calcium carbonate and salt.

**Ames Egg Mash, with Cod Liver Oil**

Dried milk, corn meal, wheat bran, wheat middlings, ground oat groats, meat scraps, fish meal, alfalfa meal, calcium carbonate, salt and Nopco XX Vitamin Concentrate.

**Ames Growing Mash, with Cod Liver Oil**

Dried milk, oat meal, ground oats, corn meal, wheat bran, wheat middlings, meat scraps, fish meal, alfalfa meal, cod liver oil, calcium carbonate, salt.

**Arcady Farms Milling Co.****Arcady 24% Open Formula Production Ration**

Soy bean oil meal, cottonseed meal, o. p. linseed oil meal, standard wheat bran, corn gluten feed, corn gluten meal, ground white oats, corn meal, brewers dried grains, malt sprouts, alfalfa meal, molasses, 1% steamed bone meal, 1% calcium carbonate from limestone, 1% salt.

**Arcady 20% Open Formula Production Ration**

Soy bean oil meal, cottonseed meal, o. p. linseed oil meal, standard wheat bran, brewers dried grains, corn gluten feed, corn gluten meal, ground white oats, corn meal, cane molasses, 1% steamed bone meal, 1% calcium carbonate from limestone, 1% salt.

**Arcady Sweet 16 Dairy Feed**

Wheat bran, soy bean oil meal, corn gluten meal, o. p. linseed oil meal, distillers corn dried grains, brewers dried grains, corn gluten feed, cleaned ground and bolted wheat screenings, ground and bolted oat mill feed (oat hulls, oat shorts, oat middlings), cottonseed meal, molasses, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Arcady-Wonder Complete All Mash Chick Starter**

Fish meal, meat scraps, animal liver meal, corn meal, wheat middlings, ground oats, ground oat groats, alfalfa leaf meal, dried buttermilk, fortified cod liver oil, steamed bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt,  $\frac{1}{4}$  oz. potassium iodide per ton.

**Old Colony Feed**

Cottonseed meal, soy bean oil meal, hominy feed, corn gluten feed, o. p. linseed oil meal, distillers corn dried grains, dried beet pulp, wheat bran, wheat middlings, ground oats, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Peerless Milk Ration**

Cottonseed meal, soy bean oil meal, corn gluten meal, o. p. linseed oil meal, corn gluten feed, wheat bran, distillers corn dried grains, brewers dried grains, cleaned ground and bolted wheat screenings, ground and bolted oat mill feed (oat hulls, oat shorts, oat middlings), malt sprouts, molasses, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt.

**Sunkist Egg Mash**

Dried buttermilk, meat scraps, gluten feed, ground yellow corn, wheat bran, fine ground oats, wheat middlings, alfalfa meal, fortified cod liver oil, 1% calcium carbonate from limestone, 1% salt.

**E. W. Bailey & Co.****Capital Dairy Ration Sweetened with Molasses**

Corn gluten feed, linseed oil meal, hominy feed, 43% cottonseed meal, ground oats, wheat bran, corn meal, edible bone meal, calcium carbonate, fine salt, molasses, soy bean meal.

## Beacon Milling Co., Inc.

**Auburn Brand Auburn Dairy Feed**

Corn gluten feed, old process linseed oil meal, soy bean oil meal, ground oats, corn meal, ground grain screenings, cotton seed meal, wheat bran, ground barley, brewer's dried grains, corn distiller's dried grains, molasses, 1% salt, 1% calcium carbonate, 1% calcium phosphate.

**Beacon Sweet "24"**

Old process linseed oil meal, soy bean oil meal, corn gluten meal, cottonseed meal, corn gluten feed, corn meal, brewer's dried grains, corn distiller's dried grains, wheat bran (may contain mill run screenings), ground oats, ground barley, molasses, 1% salt, 1% calcium carbonate.

**Beacon "20"**

Old process linseed oil meal, cottonseed meal, soy bean oil meal, corn gluten feed, corn gluten meal, corn meal, wheat bran (may contain mill run screenings), corn distiller's dried grains, ground oats, ground barley, 1% salt, 1% calcium phosphate, 1% calcium carbonate.

**Beacon Sweet "20"**

Old process linseed oil meal, soy bean oil meal, corn distiller's dried grains, cottonseed meal, wheat bran, wheat middlings, brewer's dried grains, corn gluten meal, corn gluten feed, ground barley, corn meal, ground oats, molasses, 1% calcium carbonate, 1% salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon Breeders Mash with Buttermilk**

Dried skimmilk, dried buttermilk, meat scrap, fish meal, alfalfa leaf meal, corn meal, pulverized heavy oats, pulverized heavy barley, wheat bran, wheat middlings, anti-rachitic oil,  $\frac{1}{2}\%$  fine salt,  $3\frac{1}{4}\%$  calcium carbonate,  $\frac{3}{4}\%$  calcium phosphate, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals. (Wheat bran or middlings may contain mill run screenings.)

**Beacon Broiler Feed**

Dried skimmilk, meat scrap, fish meal, ground corn, pulverized heavy oats, pulverized heavy barley, wheat bran (may contain mill run screenings), wheat red dog, alfalfa leaf meal, anti-rachitic oil,  $\frac{1}{2}\%$  salt, 2% calcium carbonate,  $\frac{1}{2}\%$  calcium phosphate.

**Beacon Complete Starting Ration**

Dried skimmilk, meat scrap, fish meal, ground corn, ground hulled oats, pulverized heavy oats, pulverized heavy barley, wheat bran (may contain mill run screenings), wheat red dog flour, alfalfa leaf meal, anti-rachitic oil,  $2\frac{1}{2}\%$  calcium carbonate,  $\frac{1}{2}\%$  calcium phosphate,  $\frac{1}{2}\%$  salt.

**Beacon Dairy Ration**

Old process linseed oil meal, soy bean oil meal, corn gluten feed, corn distiller's dried grains, ground barley, corn gluten meal, hominy feed, corn meal, cottonseed meal, ground oats, wheat bran, wheat middlings, 1% calcium carbonate,  $\frac{1}{2}\%$  calcium phosphate, 1% salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon Duck Growing Pellets**

Meat scraps, fish meal, corn meal, pulverized heavy barley, pulverized heavy oats, wheat bran (may contain mill run screenings.) Wheat red dog, alfalfa leaf meal, old process linseed oil meal, soy bean oil meal,  $1\frac{1}{2}\%$  calcium carbonate,  $\frac{1}{2}\%$  calcium phosphate,  $\frac{1}{4}\%$  salt.

**Beacon Egg Mash**

Dried buttermilk, dried skimmilk, meat scrap, fish meal, pulverized heavy barley, pulverized heavy oats, corn meal, alfalfa leaf meal, wheat bran, wheat middlings, anti-rachitic oil,  $3\frac{1}{4}\%$  calcium carbonate,  $\frac{3}{4}\%$  calcium phosphate,  $\frac{1}{2}\%$  fine salt, 1% Protozyme (an enzyme supplying product derived from biochemically processed cereals.) (Wheat bran or middlings may contain mill run screenings.)

**Beacon Fleshing Pellets**

Dried skimmilk, pulverized heavy oats, pulverized heavy barley, wheat low grade flour, corn meal, corn oil meal, wheat germ meal, anti-rachitic oil,  $1\frac{1}{2}\%$  calcium carbonate,  $\frac{1}{2}\%$  calcium phosphate, 1% salt.

**Beacon Growing Mash**

Dried skimmilk, meat scrap, fish meal, pulverized heavy oats, pulverized heavy barley, corn meal, wheat red dog, alfalfa leaf meal, wheat bran, wheat middlings, anti-rachitic oil,  $3\frac{1}{4}\%$  calcium carbonate,  $\frac{3}{4}\%$  calcium phosphate,  $\frac{1}{2}\%$  salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon's Cayuga Laying Mash**

Dried buttermilk, dried skimmilk, fish meal, meat scrap, corn meal, alfalfa leaf meal, wheat bran, wheat middlings, soy bean oil meal, pulverized heavy barley, corn gluten meal, pulverized heavy oats, anti-rachitic oil,  $\frac{1}{2}\%$  salt, 3% calcium carbonate, 1% calcium phosphate. (Wheat bran or middlings may contain mill run screenings.)

## Berkshire Coal &amp; Grain Co.

**Berkshire Hills Sweet Dairy Feed**

Wheat bran, cottonseed meal, corn gluten feed, linseed oil meal, corn meal, ground oats, calcium carbonate, molasses and salt.

**Green Mountain Dairy Ration**

Wheat bran, cottonseed meal, corn gluten feed, linseed oil meal, corn meal, ground oats and barley, calcium carbonate, salt.

**Green Mountain Laying Mash**

Wheat bran, wheat middlings, linseed oil meal, corn meal, fine ground oats, alfalfa meal, meat scraps, bone meal, fish meal, dried skim milk, calcium carbonate, salt, Nopco cod liver oil.

**Borden Grain Co.****Borden's Chick Starting Feed**

Wheat bran, wheat middlings, corn meal, ground oatmeal, alfalfa leaf meal, meat scrap, fish meal, dried milk, cod liver oil, calcium carbonate, salt, bone meal.

**Borden's Dairy Feed**

Wheat bran, wheat middlings, corn meal or hominy, gluten meal, cotton seed meal, gluten feed, linseed oil meal, calcium carbonate, bone meal, salt.

**Borden's Laying Mash**

Corn meal, wheat bran, wheat middlings, ground oatmeal, dried milk, cod liver oil, alfalfa leaf meal, fish meal, meat scrap, calcium carbonate, salt.

**Geo. B. Brown****Brown's Dairy Feed**

Wheat bran, hominy feed, oat feed, cotton seed meal, calcium carbonate, corn meal, o. p. linseed meal, corn gluten feed, molasses, bone meal, and salt.

**Brown's Egg Mash**

Corn meal, wheat midds, ground oats, wheat bran, meat scraps, bone meal, dried milk, leaf alfalfa meal, charcoal, calcium carbonate, salt, cod liver oil.

**Butman Feed Co.****Climax Laying Mash**

Corn meal, bran, middlings, ground oats, beef scraps, gluten, alfalfa meal, buttermilk, calcium carbonate, and salt.

**Community Feed Stores, Inc.****Community Chick Mash**

Yellow corn meal or hominy, feeding oat meal, wheat bran, wheat middlings, red dog middlings, alfalfa meal, dried milk, choice meat scraps, fish meal, precipitated bone meal, calcium carbonate, cod liver meal, cod liver oil, salt.

**Community-20 Dairy Ration**

Cottonseed meal 41%, corn distillers dried grains, soya bean meal, corn gluten feed, hominy or corn meal, ground oats, bran, molasses, salt, calcium carbonate.

**Community Laying Mash**

Yellow corn meal or hominy, pure ground oats, wheat bran, gluten, wheat middlings, choice meat scraps, soya bean meal, dried milk, alfalfa meal, salt, calcium carbonate, oyster shell meal, cod liver oil.

**Hilltop-20 Dairy Ration**

Cottonseed meal 41%, o. p. linseed oil meal, corn gluten feed, hominy or corn meal, oat mill feed, wheat bran, corn distillers dried grains, molasses, calcium carbonate, salt.

**Nicolas Courcy****Courcy's Dairy Feed**

Bran, middlings, Buffalo gluten, Diamond gluten, 41% cottonseed, 34% linseed, meal or hominy, salt, calcite flour.

**Courcy's Eastern Laying Mash**

Corn meal, wheat bran, flour middlings, ground oats, 50% meat scraps, 58% fish meal, alfalfa leaf meal, dry skim milk, oyster shell meal, sardine oil, dicalcium phosphate, salt, with or without cod liver oil.

**Courcy's Growing Feed**

Wheat bran, middlings, yellow corn meal, feeding oat meal, 50% scraps, linseed oil meal, bone meal, fish meal, calcite flour, leaf meal, milk, salt, with 1% cod liver oil or without.

**Cover & Palm Co.****The Perfect Dry Mash**

Alfalfa meal, hominy feed, corn meal, wheat bran, wheat middlings, gluten feed, linseed meal, meat scraps, ground oats, kaffir corn meal, salt, dried skimmilk, calcium carbonate.

**E. A. Cowee Co.****Coweco All Mash Ration**

Corn meal, ground wheat, cut oat groats, wheat bran, wheat middlings, soybean meal, alfalfa leaf meal, meat scraps, fish meal, dried milk, ground barley, edible bone meal, calcium carbonate, salt, cod liver oil.

**Coweco Growing Mash**

Wheat bran, middlings, corn meal, oat meal, ground barley, soy bean meal, alfalfa leaf meal, meat scraps, fish meal, dried milk, edible bone meal, calcium carbonate, salt, with or without molasses, with or without cod liver oil.

**Coweco Laying Mash**

Wheat bran, middlings, oat meal, gluten feed, ground barley, soy bean meal, linseed oil meal, meat scraps, fish meal, corn meal, dried milk, alfalfa leaf meal, edible bone meal, calcium carbonate, salt, with or without molasses, with or without cod liver oil.



**Coweco 1925 Ration**

Wheat bran, middlings, corn meal, cottonseed meal, gluten feed, linseed oil meal, coconut oil meal, hominy, ground oats, distillers grains, brewers grains, soy bean meal, edible bone meal, salt, calcium carbonate and molasses.

**Coweco 20% Ration**

Wheat bran, middlings, gluten feed, corn meal, distillers grains, linseed meal, soy bean meal, coconut oil meal, ground oats, cottonseed meal, brewers grains, malt sprouts, edible bone meal, calcium carbonate, salt and molasses.

**Coweco Starting Mash**

Wheat bran, middlings, corn meal, alfalfa leaf meal, oat meal, soy bean meal, fish meal, meat scraps, edible bone meal, dried milk, calcium carbonate, salt, with or without molasses, with or without cod liver oil.

**Coweco Lo-Price 20% Dairy Ration**

Bran, middlings, ground oats, cottonseed meal, corn meal, coconut oil meal, linseed meal, ground barley, soy bean meal, distillers grains, bone meal, calcium carbonate, salt and molasses.

**Coweco Sunrise 20% Dairy Ration**

Wheat bran, middlings, gluten, brewers grains, coconut oil meal, distillers grains, soy bean meal, cottonseed meal, ground cleanings from corn, oats, wheat and barley, calcium carbonate, salt and molasses.

**Coweco Sunrise Laying Mash**

Wheat bran, middlings, corn meal, hominy, ground oats, ground barley, gluten, dried milk, soy bean meal, meat scraps, alfalfa meal, edible bone meal, calcium carbonate, salt, with or without cod liver oil.

**Curley Brothers****Crystal All Grain Starting Food**

Pure dry buttermilk, cod liver oil, yellow corn meal, ground oat groats, red dog flour, bran, alfalfa leaf meal, cracked wheat, fine cracked corn, steelcut oatmeal, steamed edible bone meal, powdered charcoal, salt, calcium carbonate, white fish meal.

**Crystal 24% Dairy Ration**

Corn gluten meal, corn gluten feed, cottonseed meal, linseed oil meal, distillers grains, hominy feed, ground barley, ground oats, bran and middlings with mill run of screenings, edible bone meal, salt, calcium carbonate.

**Crystal 20% Dairy Ration**

Corn gluten feed, yellow corn meal, hominy feed, bran and middlings with mill run of screenings, cottonseed meal, linseed oil meal, beet pulp, steamed edible bone meal, calcium carbonate, salt.

**Crystal Egg Mash**

Linseed oil meal, yellow hominy feed, yellow corn meal, bran and middlings, with mill run of screenings, feeding oatmeal, red dog, alfalfa poultry greens, beef scraps, fish scraps, steamed bone meal, dried skim milk, salt, calcium carbonate.

**Crystal Growing Mash**

Cod liver oil, dried skim milk, meat scraps, white fish meal, steamed edible bone meal, alfalfa poultry greens, red dog flour, bran and middlings with mill run of screenings, feeding oatmeal, yellow hominy feed, yellow corn meal, calcium carbonate, salt.

**Crystal Starting Food for Broilers**

Yellow hominy feed, yellow corn meal, ground oat groats, bran, middlings, red dog flour, alfalfa poultry greens, meat scraps, white fish meal, dried skim milk, pure dry buttermilk, fine cracked corn, steelcut oatmeal, cracked wheat, calcium carbonate, steamed edible bone meal, salt, cod liver oil.

**Cutler Co.****King Complete Chick and Broiler Ration**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), ground oat groats, meat scraps, fish meal, alfalfa leaf meal, old process linseed oil meal, corn gluten meal, soybean oil meal, yellow corn meal, wheat bran, wheat middlings, calcium carbonate and salt.

**King Complete Laying Ration**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, whole oat groats, ground yellow corn, ground oats, alfalfa leaf meal, ground wheat, wheat bran, wheat middlings, calcium carbonate and salt.

**King Growing Feed**

Dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, alfalfa leaf meal, old process linseed meal, soybean oil meal, corn gluten meal, ground wheat, oats, barley, wheat bran, wheat middlings, wheat red dog, calcium carbonate and salt.

**King 20 Dairy Feed Sweetened**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, ground oats, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

**King 22 Milk Ration Sweetened**

Old process linseed meal, cottonseed meal, corn gluten meal, corn gluten feed, wheat bran, wheat middlings, yellow corn meal, ground barley, ground oats, alfalfa meal, bone meal, calcium carbonate, pure cane molasses and dairy salt.

**Delaware Mills, Inc.****Delaware Growing Mash**

Dried skim milk, alfalfa leaf meal, meat scrap, fish meal, bone meal, linseed oil meal, corn gluten feed, corn meal, wheat bran, wheat middlings, wheat flour middlings, oat meal, wheat meal, phosphatic calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**Delaware Sweet 24% Dairy Feed**

Cane molasses, corn gluten feed, corn gluten meal, linseed oil meal, cottonseed meal, soyabean oil meal, hominy feed, peanut oil meal, corn meal, wheat bran, wheat middlings, salt, phosphatic calcium carbonate.

**Delco 20% Dairy Feed**

Dried beet pulp, linseed oil meal, corn gluten feed, corn gluten meal, soyabean oil meal, peanut oil meal, cottonseed meal, wheat bran, wheat middlings, hominy feed, ground oats, salt, phosphatic calcium carbonate.

**Delco Sweet 20% Dairy Feed**

Cane molasses, linseed oil meal, corn gluten feed, corn gluten meal, cottonseed meal, soyabean oil meal, peanut oil meal, wheat bran, wheat middlings, hominy feed, ground oats, ground barley, phosphatic calcium carbonate, salt.

**Indian Laying Mash**

Dried skim milk, meat scrap, fish meal, bone meal, soya bean oil meal, corn gluten feed, alfalfa meal, wheat bran, wheat middlings, corn meal, ground barley, ground oats, phosphatic calcium carbonate and salt, with or without cod liver oil.

**Frank Diauto****Diauto's Fancy Chick Growing Mash**

Coarse yellow corn meal, wheat bran, wheat flour middlings, ground oats, meat scraps 60%, dried skimmed milk, fish meal 50%, alfalfa leaf meal, ground oyster shells, common salt.

**Diauto's Dairy Feed**

Gluten feed, corn meal, ground oats, bran, linseed meal, cotton seed meal, salt.

**Diauto's Special Egg Mash**

Coarse yellow corn meal, wheat bran, wheat flour middlings, ground oats, meat scraps 60%, dried skimmed milk, fish meal 50%, alfalfa leaf meal, ground oyster shells, common salt.

**F. Diehl & Son, Inc.****Diehl's Dairy Feed**

Bran, brewers grains, cottonseed meal, gluten, linseed meal, corn meal, oat meal mill by-products, ground barley, pure ground oats, wheat middlings, salt, calcium carbonate, bone meal, sweetened.

**Diehl's Dry Mash**

Alfalfa, Banner Feed, bone, dried milk, charcoal, fish scraps, gluten meal, linseed, meal, meat scraps, middlings and red dog.

**Dietrich & Gambrill, Inc.****All Mash Starter & Grower**

Corn meal, oat meal, wheat middlings, alfalfa leaf meal, malt flour, peanut meal, fish meal, dried buttermilk, cod liver oil, bone meal, 1% calcium carbonate, 1% salt.

**D. & G. Turkey Growing Mash**

Pure corn meal, wheat bran, wheat middlings, pulverized oats, oat meal, alfalfa meal, fine, soy bean meal, linseed oil meal, meat scraps, dried buttermilk, bone meal, calcium carbonate, salt.

**Gambrill's 16% Dairy Feed**

Cottonseed meal, peanut meal, gluten feed, wheat bran, corn feed meal, ground grain screenings from wheat, clipped oat byproducts, oat middlings, oat shorts, oat hulls, molasses, 1% bone meal, 1% calcium carbonate, 1% salt, brewers grains.

**Gambrill's Fattening Mash**

Reddog flour, corn meal, oat meal, linseed meal, meat scrap, bone meal, wheat bran, wheat middlings, malt flour, 1% salt.

**East Bridgewater Farmers Exchange, Inc.****Special Dairy Feed**

Brewers grains, wheat middlings, wheat bran, corn meal or hominy, ground oat., gluten meal, linseed meal, cotton seed meal, beet pulp, molasses, soy bean meal, distillers grains, and salt.

**Special Growing Feed**

Corn meal, wheat bran, wheat middlings, reddog flour, alfalfa leaf meal, dried milk, choice fine ground beef scraps, fortified cod liver oil, ground oats, ground barley, ground wheat, fish scraps.

**Special Mash Feed**

Yellow corn meal, wheat bran, wheat middlings, reddog flour, fine ground beef scraps, alfalfa leaf meal, ground oats, dried milk, ground barley, ground wheat, fortified cod liver oil.



### Eastern Grain Co.

#### Eastern 24% Dairy Ration Sweetened

Bran, middlings, cottonseed, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten, brewers grains, ground barley, corn meal, hominy, pure cane molasses, soy bean meal, high grade edible bone meal, calcium carbonate, salt.

#### Eastern 20% Dairy Ration Sweetened

Bran, middlings, cottonseed meal, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten, brewers grains, ground barley, corn meal, cane molasses, soy bean meal, high grade edible bone meal, calcium carbonate, hominy, salt.

### Eastern States Farmers' Exchange

#### Eastern States Combination Mash

E. S. yellow corn meal—attrition, wheat bran (may contain mill run wheat screenings), wheat flour middlings, E. S. ground oats, dried skimmed milk, alfalfa leaf meal, 50 per cent protein meat scraps, 58 per cent protein fish meal, oyster shell meal, sardine oil, dicalcium phosphate, salt.

#### Eastern States Controller Mash

Dried skimmed milk, E. S. yellow corn meal—attrition, wheat bran (may contain mill run wheat screenings), ground oat groats, oyster shell meal, salt, dicalcium phosphate, sardine oil.

#### Eastern States Developer

E. S. yellow corn meal—attrition, wheat bran (may contain mill run wheat screenings), wheat flour middlings, E. S. ground barley, E. S. ground oats, dried skimmed milk, 41% protein soybean oil meal, alfalfa leaf meal, 50% protein meat scraps, 58% protein fish meal, dicalcium phosphate, oyster shell meal, sardine oil, salt.

#### Eastern States Fattener Mash

E. S. yellow corn meal—attrition, corn oil meal, ground oat groats, dried skimmed milk, wheat standard middlings, wheat red dog, E. S. ground oats, 41 per cent protein soybean oil meal, salt.

#### Eastern States Fulpail Dairy Ration

Yellow hominy feed, distillers' corn dried grains, E. S. ground oats, wheat bran (may contain mill run wheat screenings), 41 per cent protein soybean oil meal, 41 per cent protein cottonseed meal prime quality, corn gluten feed, cane molasses, E. S. ground barley, dicalcium phosphate, salt.

#### Eastern States Highland 20 Dairy Ration

Distillers' corn dried grains, oat mill feed (oat hulls, oat shorts, oat middlings), 41 per cent protein cotton seed meal prime quality, yellow hominy feed, cane molasses, corn gluten feed 41 per cent protein soybean oil meal, E. S. ground barley, wheat bran (may contain mill run wheat screenings), calcium carbonate, salt.

#### Eastern States Highland 16 Dairy Ration

Yellow hominy feed, distillers' corn dried grains, oat mill feed (oat hulls, oat shorts, oat middlings), cane molasses, corn gluten feed, E. S. ground barley, wheat bran (may contain mill run wheat screenings), 41 per cent protein cottonseed meal prime quality, 41 per cent protein soybean oil meal, calcium carbonate, salt.

#### Eastern States Milkmore Dairy Ration

41 per cent protein cottonseed meal prime quality, distillers' corn dried grains, corn gluten feed, 41 per cent protein soybean oil meal, wheat bran (may contain mill run wheat screenings), yellow hominy feed, E. S. ground oats, cane molasses, dicalcium phosphate, salt.

#### Eastern States Producer 20

E. S. yellow corn meal—attrition, wheat bran (may contain mill run wheat screenings), wheat flour middlings, 50% protein meat scraps, E. S. ground oats, alfalfa leaf meal, dried skimmed milk, 58% protein fish meal, 41% protein soybean oil meal, oyster shell meal, sardine oil, dicalcium phosphate, salt.

#### Eastern States Producer Mash

E. S. yellow corn meal—attrition, wheat bran (may contain mill run wheat screenings), wheat flour middlings, E. S. ground oats, 50% protein meat scraps, 58% protein fish meal alfalfa leaf meal, dried skimmed milk, oyster shell meal, sardine oil, dicalcium phosphate, salt.

#### Eastern States Sixteen Dairy Ration

Yellow hominy feed, wheat bran (may contain mill run wheat screenings), E. S. ground oats, distillers' corn dried grains, cane molasses, corn gluten feed, E. S. ground barley, 41 per cent protein cotton seed meal prime quality, 41 per cent protein soybean oil meal, dicalcium phosphate, salt.

#### Eastern States Starting and Broiler Ration

E. S. yellow corn meal—attrition, wheat bran (may contain mill run wheat screenings), wheat flour middlings, ground oat groats, dried skimmed milk, alfalfa leaf meal, 50 per cent protein meat scraps, 58 per cent protein fish meal, oyster shell meal, salt, sardine oil, dicalcium phosphate.

#### Eastern States Turkey-Fat

E. S. yellow corn meal—attrition, wheat bran (may contain mill run wheat screenings), wheat flour middlings, ground oat groats, dried skimmed milk, E. S. ground oats, 50 per cent protein meat scraps, alfalfa leaf meal, 41 per cent protein soybean oil meal, corn gluten meal, oyster shell meal, dicalcium phosphate, salt.

#### Eastern States Turkey-Grow

E. S. yellow corn meal—attrition, wheat bran (may contain mill run wheat screenings), wheat flour middlings, ground oat groats, 50 per cent protein meat scraps, alfalfa leaf meal, dried skimmed milk, 41 per cent protein soybean oil meal, 58 per cent protein fish meal, corn gluten meal, oyster shell meal, dicalcium phosphate, sardine oil, salt.

**Eastern States Turkey-Start**

E. S. yellow corn meal—attribution, wheat bran (may contain mill run wheat screenings), ground oat groats, wheat flour middlings, 50 percent protein meat scraps, 41 per cent protein soybean oil meal, corn gluten meal, dried skimmed milk, 58 per cent protein fish meal, alfalfa leaf meal, oyster shell meal, dicalcium phosphate, sardine oil, salt.

Michael W. Ellis

**The Ellis Dairy Feed**

Corn meal, wheat middlings, wheat bran, gluten meal, hominy feed, gluten feed, corn distillers grains, cotton seed meal, oil meal, ground oats, calcite flour, salt, edible bone meal. (Wheat feeds may contain screenings not exceeding mill run.)

**The Ellis Poultry Mash**

Wheat bran, wheat middlings, hominy feed, gluten feed, corn meal, rolled oats or feeding oatmeal, alfalfa leaf meal, cod liver oil, beef scraps, dried skim milk or buttermilk, edible bone meal, salt, charcoal, calcite flour. (Wheat feeds may contain screenings not exceeding mill run.)

Elmore Milling Co., Inc.

**Elmore Complete Broiler Ration**

Yellow corn meal, wheat bran, wheat middlings, oat meal flour, meat meal, edible bone meal, dried buttermilk, alfalfa leaf meal, cod liver oil, salt.

**Elmore Egg Mash**

20% dried buttermilk and meat scraps, also 2nd clear wheat flour, pure ground oats, wheat middlings, alfalfa leaf meal, corn meal or hominy feed, wheat bran, cod liver oil, not more than 1% calcium carbonate, salt, fish meal.

**Elmore Eggmaker**

Dried buttermilk, meat and bone meal, wheat bran, wheat red dog midds, corn meal, fish meal, ground oats, calcium carbonate, salt.

**Elmore Milk Grains**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, molasses, calcium carbonate and salt, soybean oil meal.

**Elmore Milk Grains Junior**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, calcium carbonate, salt, soybean oil meal, molasses.

**Elmore's Sweet Digesto Dairy Feed**

Corn gluten feed, cottonseed meal, wheat bran, coconut oil meal, pulverized wheat screenings, oat meal mill by-products (oat hulls, oat midds and oat shorts), cane molasses, salt.

**Emco Feed**

Wheat bran, wheat midds, linseed oil meal, beet pulp, corn gluten feed, corn meal or hominy feed, cotton seed meal, calcium carbonate, salt.

**Granger 20% Dairy Ration**

Wheat bran, wheat midds, ground barley, cottonseed meal, corn gluten feed, corn meal or hominy feed, soybean meal, cane molasses, reground wheat screenings, calcium carbonate, salt, ground oats, dried brewers' grains, copra oil meal.

John W. Eshelman & Sons

**Eshelman Certified 20% Dairy Ration**

Corn gluten feed, choice hominy feed, pure ground 38 lb. No. 2 white clipped oats, 34% o. p. oil meal, standard wheat bran, 41% pro. cottonseed meal, soybean oil meal, standard wheat middlings, corn distillers' dried grains, cane molasses, steamed bone meal, calcium carbonate, salt.

**Eshelman Challenge Dairy Feed**

Cottonseed meal, wheat bran, corn gluten feed, cane molasses, corn gluten meal, ground oats, dried brewers' grains, corn distillers' grains, corn meal, o. p. oil meal, soybean oil meal, reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Conestoga 20 Dairy Feed**

Cottonseed meal, wheat bran, cane molasses, corn gluten feed, dried brewers' grains, corn distillers' grains, soybean oil meal, o. p. oil meal, reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Lancaster 20 Dairy Feed**

Wheat bran, cottonseed meal, ground oats, corn gluten feed, cane molasses, dried brewers' grains, corn distillers' grains, corn meal, o. p. oil meal, soybean oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Pennsy 16 Dairy Feed**

Wheat bran, cottonseed meal, cane molasses, corn gluten feed, dried brewers' grains, o. p. oil meal, soybean oil meal, reground grain screenings from wheat, oat meal mill byproduct (oat midds, oat hulls, oat shorts), 1% bone meal, 1% salt, 1% calcium carbonate.

**Eshelman Red Rose 24 Dairy Feed**

Cottonseed meal, wheat bran, corn gluten feed, cane molasses, corn gluten meal, ground oats, dried brewers' grains, corn distillers' grains, corn meal, o. p. oil meal, soybean oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Red Rose Growing Mash**

Wheat middlings, corn meal, wheat bran, meat scrap, pulverized oats, corn gluten feed, pure oat meal, hominy feed, o. p. oil meal, fish meal, 3% dried buttermilk, 2% fine alfalfa meal, 1% calcium carbonate,  $\frac{3}{4}$ % salt,  $\frac{3}{4}$ % fortified cod liver oil.

**Farm Service Stores, Inc.****C Growing Mash**

Corn meal-or-hominy, mixed feed, ground oats, 45% meat scraps, dried milk, fish scraps, alfalfa meal, calcium carbonate, salt, cod liver oil.

**Diamond A Dairy Ration**

Corn meal-or-hominy, oil meal-or-soybean meal, corn gluten feed, wheat bran, dried grains, corn gluten meal, cottonseed meal, stock feed, salt, calcium carbonate.

**Diamond C Dairy Feed**

Wheat bran, wheat midds, corn meal-or-hominy, cottonseed meal, oil meal-or-soybean meal, beet pulp, gluten feed, gluten meal, salt.

**New England Dairy Ration**

Corn gluten meal, corn gluten feed, wheat bran, corn meal-or-hominy, oil meal-or-soybean meal, cottonseed meal, ground oats, ground limestone, salt, molasses.

**North Star 20% Dairy Feed**

Corn meal-or-hominy, ground oats, soy bean meal-or-oil meal, dried grains, ground grain screenings, wheat bran, corn gluten feed, cottonseed meal, molasses, calcium carbonate, bone meal, salt, beet pulp, corn gluten meal.

**North Star Growing Mash**

Corn meal-or-hominy, ground-or-pulverized oats, alfalfa meal, wheat midds, wheat bran, corn gluten feed, oil meal-or-soybean meal, calcium carbonate, meat scraps, bone meal, fish meal, salt, dried milk (with-or-without cod liver oil).

**North Star Laying Mash**

Corn meal-or-hominy, ground-or-pulverized oats, alfalfa meal, wheat midds, wheat bran, corn gluten feed, oil meal-or-soybean meal, calcium carbonate, meat scraps, bone meal, fish meal, dried milk, salt (with or without cod liver oil).

**Flory Milling Co., Inc.****Flory's "All-Mash" Chick Starter**

Oatmeal, yellow corn meal, wheat bran, standard wheat middlings, choice fine alfalfa meal, dried tomato pulp, ground barley, dried buttermilk, milk sugar feed or dried whey (feeding), fish meal, meat scrap, crab meal, soybean meal, linseed oil meal, ground wheat, ground oats, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's Blue Seal "All-Mash" Laying Ration**

Pure corn meal, meat scrap, alfalfa leaf meal, fish meal, oatmeal, dried buttermilk, soybean meal, milk sugar feed or dried whey (feeding), ground barley, ground wheat, wheat bran, standard wheat middlings, crab meal, tomato pulp, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's Dairy Feed**

Cottonseed meal, o. p. oil meal, coconut oil meal, soybean meal, corn gluten feed, corn gluten meal, dried malt grains, alfalfa meal, wheat bran, standard wheat middlings, buckwheat middlings, molasses, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's Growing Mash**

Yellow corn meal, dried buttermilk, choice alfalfa meal, dried tomato pulp, ground white oats, ground barley, standard wheat middlings, wheat bran, corn gluten meal, meat scrap, fish meal, crab meal, soybean meal, linseed oil meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

**Golden Egg Laying Mash**

Dried buttermilk, meat scrap, fish meal, crab meal, dried tomato pulp, o. p. oil meal, soybean meal, yellow corn meal, wheat flour middlings, ground barley, wheat bran, ground white oats, choice alfalfa meal, corn gluten meal, milk sugar feed or dried whey (feeding), buckwheat middlings, coconut oil meal, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**National Dairy Feed**

Dried malt grains, cocoa shell meal, corn gluten feed, standard wheat middlings, wheat bran, alfalfa meal, buckwheat middlings, cottonseed meal, reground oatfeed (oat middlings, oat shorts, oat hulls), coconut oil meal, reground grain screenings, sugar cane molasses, essential minerals (calcium carbonate, calcium sulphate, calcium phosphate, iron sulphate, sulphur, iodine and salt).

**Record Dairy Feed**

O. p. oil meal, cottonseed meal, soybean meal, corn gluten feed, buckwheat middlings, standard wheat middlings, wheat bran, dried malt grains, ground oats, molasses, alfalfa meal, coconut oil meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Sunray Laying Mash**

Milk sugar feed or dried whey (feeding), meat scrap, alfalfa meal, wheat bran, standard wheat middlings, buckwheat middlings, ground oats, ground barley, corn meal, hominy, coconut oil meal, calcium carbonate, crab meal, fish meal, salt, cod liver oil.

## Fred A. Fountain

**Fountain's Buttermilk Laying Mash**

Dry buttermilk or dry skim milk, beef scrap, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, fish meal, table salt.

**Fountain's Buttermilk Starting Feed**

Dry buttermilk or dry skim milk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, calcium carbonate, table salt.

## Dean S. French

**Special Mash or Poultry Feed**

Wheat feed, corn meal, gluten feed, alfalfa meal, linseed meal, meat scraps, ground oats, charcoal, dried milk, salt, cod liver oil, ground bone.

**Garland's Economy 20% Dairy Ration**

Bran, middlings, meal, cottonseed meal, gluten feed, linseed meal, ground barley, dried brewers grains, soy bean meal, distillers grains, cocoanut oil meal, malt sprouts, bone meal, calcium carbonate, salt and molasses.

**Garland's Economy Egg Mash**

Wheat bran, middlings, corn meal, hominy, soy bean meal, gluten meal, pulverized oats, dried milk, beef scraps, ground alfalfa, calcium carbonate, bone meal, salt, cod liver oil and ground barley.

**Garland's Fancy Chick Mash**

Wheat bran, middlings, oat meal, corn meal, alfalfa leaf meal, meat scraps, fish meal, dried milk, soy bean meal, bone meal, calcium carbonate, salt and cod liver oil. (With or without cane molasses.)

**Garland's 24% Ration**

Wheat bran, middlings, corn meal, hominy, gluten feed, linseed meal, cottonseed meal, soy bean meal, cocoanut oil meal, ground oats, brewers grains, distillers grains, bone meal, calcium carbonate, salt and cane molasses.

**Royal Worcester Complete Ration**

Gluten feed, linseed, ground oats, wheat bran, middlings, corn meal, cottonseed meal, soy bean meal, beet pulp, bone meal, calcium carbonate, salt and molasses.

## General Mills, Inc.

**Eventually Gold Medal Chick Ration**

Wheat bran, wheat standard middlings, yellow corn meal, ground oat groats, alfalfa meal, meat and bone scraps, dried skimmilk, dried buttermilk, ground limestone  $2\frac{1}{4}\%$ , salt  $\frac{1}{2}\%$ , cod liver oil extract.

**Eventually Gold Medal Dairy Ration**

Wheat bran, wheat standard middlings, ground oats, yellow corn meal, corn gluten feed, cottonseed meal, linseed oil meal, ground limestone  $2\frac{3}{4}\%$ , salt  $\frac{3}{4}\%$ .

**Eventually Gold Medal Egg Mash**

Wheat bran, wheat standard middlings, yellow corn meal, ground oats, alfalfa meal, meat and bone scraps, dried skimmilk, dried buttermilk, ground limestone  $3\%$ , salt  $1\%$ , cod liver oil extract.

**Eventually Gold Medal Growing Mash**

Wheat bran, wheat standard middlings, yellow corn meal, ground oats, alfalfa meal, meat and bone scraps, dried skimmilk, dried buttermilk, ground limestone  $2\frac{1}{4}\%$ , salt  $\frac{3}{4}\%$ , cod liver oil extract.

## W. K. Gilmore &amp; Sons, Inc.

**Conference Mash**

Yellow corn meal, standard wheat bran, wheat flour middlings, pure ground oats, meat scraps  $50\%$ , pure fish meal  $55\%$ , alfalfa leaf meal, milk, calcite flour, cod liver oil, dicalcium phosphate, salt.

## Goode Grain Co.

**Goode Starting & Growing Mash, New England Conference Formula**

Yellow corn meal, wheat bran, wheat flour middlings, ground oats, meat scraps, fish meal, alfalfa leaf meal, dried skim or dried buttermilk, calcium carbonate, salt, cod liver oil.

**Goode Laying Mash. Mass. Agri. College Formula**

Coarse yellow corn meal, wheat bran, wheat middlings, ground oats, meat scraps, fish meal, alfalfa leaf meal, dried skim or buttermilk, calcium carbonate, salt, with and without cod liver oil.

## D. H. Grandin Milling Co.

**Grandin's Combined Chick and Broiler Ration**

Dried buttermilk, ground meat and bone, fish meal, alfalfa leaf meal, wheat middlings, corn meal, hominy feed, ground hulled oats, ground wheat, ground barley, bone meal, calcium carbonate, salt and cod liver oil.

**Grandin's 24% Balanced Dairy Ration**

Distillers dried grains, cottonseed meal, coconut oil meal, linseed oil meal, corn gluten feed, wheat bran, wheat middlings, hominy feed, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 24% Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, cane molasses, steamed bone meal, calcium carbonate, salt, soy bean oil meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 20% Dairy Feed**

Linseed oil meal, cottonseed meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, cane molasses, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Growing Mash with Buttermilk**

Ground meat and bone, dried buttermilk, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, alfalfa meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Growing Mash with Buttermilk—Cod Liver Oil**

Ground meat and bone, dried buttermilk, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, alfalfa meal, bone meal, calcium carbonate, salt and cod liver oil. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Laying Mash with Buttermilk**

Ground fish, ground meat and bone, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, powdered buttermilk, alfalfa meal, calcium carbonate and a small percentage of salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Laying Mash with Buttermilk—Cod Liver Oil**

Ground fish, ground meat and bone, corn gluten feed, corn gluten meal, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground oats, powdered buttermilk, alfalfa meal, calcium carbonate, a small percentage of salt and cod liver oil. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Milk Maker**

Linseed oil meal, cottonseed meal, coconut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, beet pulp, steamed bone meal, calcium carbonate, salt and soy bean oil meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's 12 Twin Six 12 Dairy Feed**

Linseed oil meal, cottonseed meal, coconut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, alfalfa meal, steamed bone meal, calcium carbonate, salt, and soy bean oil meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 12 Twin Six 12 Dairy Feed**

Linseed oil meal, cottonseed meal, coconut oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, alfalfa meal, cane molasses, steamed bone meal, calcium carbonate, salt and soy bean oil meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**M-S (Money Saver) 20% Sweetened Dairy Feed**

Cottonseed meal, soybean oil meal, linseed oil meal, corn gluten feed, wheat bran, wheat middlings, corn meal, corn feed meal, hominy feed, ground grain screenings, oat meal mill by-products (oat middlings, oat hulls, oat shorts), cane molasses, steamed bone meal, calcium carbonate and salt.

**Great Atlantic & Pacific Tea Co.****Daily Egg Mash Feed**

Ground oats, ground barley, soybean oil meal, old process linseed oil meal, corn gluten meal, wheat standard middlings, wheat bran, alfalfa meal, corn feed meal, dried buttermilk, dried skim milk, meat and bone scrap, fish meal, flour middlings, cod liver oil, cod liver meal, calcium carbonate from limestone  $2\frac{1}{2}\%$ , steamed bone meal  $1\frac{1}{2}\%$ , salt  $\frac{1}{2}$  of 1%, red iron oxide 1/10%, and .0015% potassium iodide.

**Daily Growth Growing Mash**

Meat and bone scrap, dried buttermilk, dried skimmed milk, wheat bran, alfalfa meal, wheat standard middlings, corn feed meal, ground oats, ground barley, old process linseed oil meal, corn gluten feed, cod liver oil, calcium carbonate from limestone 1%, steamed bone meal  $\frac{1}{2}\%$ , salt  $\frac{1}{2}$  of 1%.

**D. Harbeck****Welcome Dairy Feed**

Bran, beet pulp, cotton seed meal, corn gluten meal, ground oats, hominy or corn meal, oil meal, middlings, steamed bone meal, 1% salt.

**Welcome Laying Mash**

Corn meal, wheat bran, flour middlings, ground oats, meat scraps, fish meal, alfalfa leaf meal, dried skimmed milk or dried buttermilk, salt, shell flour, cod liver oil.

**D. B. Hodgkins' Sons****Hodgkins' Dairy Ration**

Wheat bran, hominy, ground oats, corn gluten feed, corn meal, cottonseed meal, soy bean meal, linseed meal, brewers grains, molasses, calcium carbonate, salt and beet pulp.

**Hodgkins' Poultry Mash**

Ground corn, oats, middlings and bran (with screenings not to exceed mill run), corn gluten feed, linseed meal, ground meat scraps, calcium carbonate, dried skim milk, dairy salt, fish meal, dried buttermilk, alfalfa leaf meal and charcoal, also with cod liver oil.

**Horvitz Grain Co.****Make-M-Lay Laying Mash**

Wheat bran, corn meal, gluten feed and gluten meal, ground oats, ground barley, red dog, wheat middlings, linseed meal, meat scraps, calcium carbonate, charcoal.

**Wantmore Dairy Ration**

Hominy feed or corn meal, wheat bran, ground oats, gluten feed and gluten meal, linseed meal, cottonseed meal, wheat middlings, calcium carbonate, salt.

**Wantmore Dairy Ration with Beet Pulp**

Hominy feed or corn meal, wheat bran, gluten feed and gluten meal, linseed meal, cottonseed meal, wheat middlings, salt, beet pulp, calcium carbonate.

**Wantmore 24% Sweetened Dairy Ration**

Corn gluten meal, corn gluten feed, old process linseed meal, soybean oil meal, cottonseed meal, brewers grains, hominy, corn meal, ground oats, ground barley, wheat bran, wheat middlings, calcium carbonate, dairy salt, pure cane molasses.

**R. B. Howlett****Ideal Poultry Mash**

Wheat bran, yellow corn meal, meat scraps, wheat middlings, ground oats, dried milk, bone meal, alfalfa leaf meal, salt, fish meal.

**Jaquith & Co.****Jaquith & Co. Dairy Ration**

Wheat bran and middlings, cottonseed meal, oil meal, soya bean meal, salt, gluten feed, alfalfa, ground oats and corn, dried grains, molasses.

**Jaquith & Co. Growing Mash**

Ground corn, wheat and oats, soy bean meal, meat and bone meal, salt, buttermilk, alfalfa, Nopco XX cod liver oil, oil meal, shell meal.

**Jaquith & Co. Laying Mash**

Ground corn, wheat and oats, gluten feed, oil meal, meat scraps, buttermilk, soy bean meal, alfalfa meal, salt and Nopco XX cod liver oil.

**Jersee Co.****Just Right Dairy Ration 20%**

Corn gluten feed, ground oats, ground corn, wheat bran, oil meal, cottonseed meal, salt, calcium carbonate (limestone), bone meal, potassium iodide, anise, oxide iron, sugar, St. John's bread (locust bean meal).

**Just Right Growing Mash**

Standard middlings, feeding oat meal, corn meal, alfalfa meal, meat scraps, fish meal, bone meal, charcoal, calcium carbonate (limestone), powdered whole and skim milk, St. John's bread, starch, milk sugar, wheat red dog, oxide iron, di-calcium phosphate, anise, dried blood, iodized salt, yeast, cod liver oil.

**Kasco Mills, Inc.****Apex Complete Grower**

Corn meal, pulverized oats, wheat bran, wheat middlings, soy bean meal, linseed oil meal, alfalfa meal, meat scrap, fish meal, bone meal, dried skim milk, milk sugar feed (dried whey),  $\frac{1}{2}$  of 1% salt, calcite, tested cod liver oil. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run).

**Apex Laying Mash**

Wheat bran, wheat middlings, corn meal, linseed oil meal, soy bean meal, pulverized oats, meat scrap, bone meal, fish meal, dried skim milk, milk sugar feed (dried whey),  $\frac{3}{4}$  of 1% salt, calcite, tested cod liver oil, alfalfa meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run).

**Kasco All Mash Chick Food**

Wheat reddog, oatmeal, wheat middlings, wheat bran, corn meal, meat scrap, fish meal, bone meal, linseed oil meal, dried skim milk, milk sugar feed (dried whey),  $\frac{1}{2}$  of 1% salt, tested cod liver oil, calcite, alfalfa leaf meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run).

**Kasco All Mash Growing Food**

Wheat reddog, pulverized oats, oatmeal, wheat middlings, wheat bran, corn meal, meat scrap, fish meal, bone meal, linseed oil meal, dried skim milk, milk sugar feed (dried whey),  $\frac{1}{2}$  of 1% salt, tested cod liver oil, calcite, alfalfa leaf meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run).



**Kasco All Mash Laying Food**

Corn meal, pulverized oats, oatmeal, wheat bran, wheat middlings, wheat reddog, linseed oil meal, soy bean meal, ground barley, meat scrap, bone meal, fish meal, dried skim milk, milk sugar feed (dried whey),  $\frac{1}{2}$  of 1% salt, calcite, tested cod liver oil, alfalfa meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run).

**Kasco Poultry Flushing Mash**

Wheat reddog, oatmeal, wheat middlings, wheat bran, corn meal, meat scrap, fish meal, bone meal, linseed oil meal, milk sugar feed (dried whey),  $\frac{1}{2}$  of 1% salt, tested cod liver oil, calcite, alfalfa leaf meal. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run).

**Larrowe Milling Co.****Larro**

Cottonseed meal, yellow corn meal, wheat standard middlings, soybean oil meal, o. p. linseed oil meal, corn gluten feed, dried beet pulp, wheat bran,  $\frac{3}{4}\%$  salt.

**Larro Chick Starter**

Yellow corn meal, ground oat groats, wheat standard middlings, wheat bran, meat and bone scraps, dried buttermilk, dried skimmed milk, alfalfa meal,  $1\frac{3}{4}\%$  limestone,  $\frac{1}{4}\%$  salt, cod liver oil extract.

**Larro Egg Mash**

Wheat bran, wheat standard middlings, yellow corn meal, meat and bone scraps, ground barley, soybean oil meal, ground oats, alfalfa meal, dried skimmed milk, dried buttermilk,  $2\frac{1}{2}\%$  limestone,  $\frac{1}{2}\%$  salt, cod liver oil extract.

**Larro Growing Mash**

Yellow corn meal, wheat standard middlings, wheat bran, meat and bone scraps, alfalfa meal, ground oats, dried buttermilk, dried skimmed milk, soybean oil meal, 2% limestone,  $\frac{1}{2}\%$  salt, cod liver oil extract.

**Larrowe's 16 Dairy Feed**

Cottonseed meal, corn gluten feed, wheat standard middlings, o. p. linseed oil meal, yellow corn meal, dried beet pulp, wheat bran, 1% salt.

**Mansfield Milling Co.****Mansfield Chick-Growing Feed**

Wheat bran, red dog flour, corn meal, oat meal, fish scraps, meat scraps, dried milk, charcoal, and cod liver oil.

**Mansfield Cow-Ration**

Wheat bran, corn meal, ground oats, ground barley, cotton seed meal, linseed meal, gluten feed, gluten meal and salt.

**Mansfield Dry-Poultry Mash**

Wheat bran, wheat middlings, red dog flour, corn meal, gluten feed, dried milk, meat scraps, alfalfa meal and cod liver oil.

**Maritime Milling Co., Inc.****B-B Hi-Test Dairy Feed 24% Pro. Sweetened**

Dried brewers grains, cotton seed meal, corn gluten feed, soya bean meal, hominy feed, corn meal, ground oats, cleaned, pulverized and bolted grain screenings, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

**B-B Hi-Test Dairy Feed 20% Pro. Sweetened**

Dried brewers grains, cotton seed meal, corn gluten feed, soya bean oil meal, hominy feed, ground oats, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

**B-B Marmico 16% Protein Dairy Feed with Molasses**

Dried brewers grains, soya bean oil meal, cotton seed meal, corn gluten feed, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, oat hulls, oat shorts, oat midds, molasses, steamed bone meal, calcium carbonate and salt.

**Sweetened Dollar \$ Maker 20% Pro. Dairy Feed**

Dried buttermilk, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn gluten feed, ground wheat, corn meal, pulverized barley, pulverized oats, meat meal, bone meal, calcium carbonate and salt. (Wheat bran may contain ground screenings not exceeding mill run).

**Dollar \$ Maker Egg Mash**

Dried buttermilk, alfalfa meal, wheat bran, wheat middlings, soya bean oil meal, corn gluten feed, ground wheat, corn meal, pulverized barley, pulverized oats, meat meal, bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run).

**Geo. Q. Moon & Co., Inc.****Moon's Baby Chick Starter Mash**

Roller corn meal, wheat middlings, our make white wheat middlings, fine ground alfalfa meal, meat scrap, bone meal, dried buttermilk, calcium carbonate, calcium phosphate, cod liver oil,  $\frac{1}{2}$  of 1% salt, wheat bran, dried skim milk.

**Moon's 24% Dairy Ration**

Corn distillers grains, o. p. oil meal, corn gluten meal, cottonseed meal, corn gluten feed, wheat middlings and wheat bran (with ground screenings not to exceed mill run), dried brewers grains, calcium carbonate,  $\frac{3}{4}$  of 1% salt, corn meal, soy bean meal, molasses, hominy, coconut oil meal.

**Moon's 20% Dairy Feed with Molasses**

O. p. oil meal, corn gluten meal, cottonseed meal, wheat bran and wheat middlings (with ground screenings not to exceed mill run), dried brewers grains, cleaned, ground and bolted wheat screenings, ground and bolted clipped oat by-product, molasses, corn gluten feed, calcium carbonate,  $\frac{1}{2}$  of 1% salt, soy bean meal, hominy, coconut oil meal.

**Moon's Growing Mash**

Wheat bran, our make white wheat middlings, roller corn meal, fine ground alfalfa meal, meat scrap, bone meal, dried buttermilk, calcium carbonate, calcium phosphate, dried skim milk, cod liver oil.

**Moon's Laying Mash**

Wheat bran (with ground screenings not to exceed mill run), our make pure white wheat middlings, roller process corn meal, ground oats, fine ground pea green alfalfa meal, meat scrap, dried buttermilk, ground barley, ground buckwheat, calcium carbonate, calcium phosphate, corn gluten meal.

**Special A Dairy 20% Ration**

Corn gluten feed, cottonseed meal, oil meal, wheat bran, hominy, dried brewers grains, ground barley, calcium carbonate, calcium phosphate,  $\frac{1}{2}$  of 1% salt, soybean meal, hominy, coconut oil meal.

**Moon's Special A Laying Mash**

Meat scrap, alfalfa meal, standard wheat middlings (with ground screenings not to exceed mill run), corn meal, ground barley, ground oats, ground buckwheat, calcium carbonate, calcium phosphate,  $\frac{1}{2}$  of 1% salt, dried buttermilk, corn gluten meal.

**U. S. 24% Dairy Ration**

Corn gluten feed, cottonseed meal, rye distillers grains, ground grain screenings from wheat, coconut oil meal, ground and bolted clipped oat by-product, wheat bran (with ground screenings not to exceed mill run), corn meal, hominy feed, calcium carbonate, salt, molasses, soy bean meal.

**U. S. 20% Dairy Ration**

Corn gluten feed, cottonseed meal, coconut oil meal, bran, corn meal, corn distillers grains, rye distillers grains, oat feed, molasses, calcium carbonate, bone meal, salt, soybean oil meal.

**U. S. Drought Ration**

Corn gluten feed, rye distillers grains, brewers dried grains, wheat bran (with ground screenings not to exceed mill run), coconut oil meal, hominy feed and corn meal, oat feed (oat middlings, oat shorts, oat hulls), molasses, bone meal, steamed, 1% salt, calcium carbonate, soybean oil meal.

**Ogden Grain Co.****Good Value 20% Dairy Ration**

Corn distillers' grains, soyabean oil meal, pure ground barley, yellow hominy or corn meal, o. p. linseed oil meal, 11% cottonseed meal, corn gluten feed, #2 38# ground oats, standard wheat bran, molasses, steamed bone meal, calcium carbonate, salt.

**Good Value Laying Mash**

Pulverized 36/38 No. 2 oats, meat scraps, fish meal, alfalfa leaf meal, No. 2 yellow corn meal, standard wheat bran, wheat flour middlings, dried skim milk, salt, calcium carbonate, cod liver oil.

**Thrifty Complete Laying Mash**

Pulverized oats, meat scraps, dried skim milk, fish meal, corn meal, gluten meal, standard wheat bran, standard wheat middlings, cracked corn and wheat, cod liver oil, calcium carbonate, salt.

**20% Thrift Dairy**

Soyabean oil meal, old process linseed oil meal, gluten meal, corn meal, low fibre ground oats, cotton seed meal, standard wheat bran, standard wheat middlings, ground wheat screenings, molasses, calcium carbonate, salt.

**Thrift Starting & Growing Mash**

Corn meal, standard wheat bran, pulverized oats, flour middlings, dried skim milk, alfalfa meal, fish meal, meat scraps, calcium carbonate, salt, cod liver oil.

**Park & Pollard Co.****Bidwell Dry-Mash with Cod Liver Oil**

Dried buttermilk, vitamin tested cod liver oil, alfalfa meal, corn meal, wheat bran, wheat middlings, fish meal, meat, bone, linseed oil meal, gluten meal, soya bean meal, calcium carbonate, salt and ground: wheat, barley, kaffir corn and buckwheat.

**Lay or Bust Dry-Mash**

Dried buttermilk, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soya bean meal, wheat bran and wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley, kaffir corn, buckwheat.



**Lay or Bust Dry-Mash with Cod Liver Oil**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soya bean meal, wheat bran and wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley, kafir corn, buckwheat.

**Manamar Complete Life Cycle Mash**

Kelp, Pacific Coast fish meal and marine sea shells, meat scrap, pure wheat bran, wheat middlings, alfalfa leaf meal, ground yellow corn, ground oats, vitamin tested cod liver oil.

**Manamar 20% Dairy Ration**

Kelp, Pacific Coast fish meal and marine sea shells, corn distillers grains, linseed oil meal, soya bean meal, malt sprouts, wheat bran, brewers dried grains, hominy feed, ground oats, molasses, calcium carbonate and salt.

**Manamar Doublex 20% Dairy Ration**

Kelp, Pacific Coast fish meal, marine sea shells, linseed oil meal, gluten feed, gluten meal, soya bean meal, ground barley, wheat bran, malt sprouts, cottonseed meal, hominy, fine ground grain screenings, molasses, calcium carbonate and salt.

**Manamar Growing Feed**

Kelp, Pacific Coast fish meal and marine sea shells, wheat bran, wheat middlings, meat scrap, ground oats, alfalfa leaf meal, ground yellow corn.

**Manamar Lay or Bust Mash**

Kelp, Pacific Coast fish meal and marine sea shells, dried buttermilk, meat scrap, alfalfa leaf meal, pure wheat bran, wheat middlings, ground yellow corn, ground oats, vitamin tested cod liver oil.

**Milk-Maid 24% Sweetened Dairy Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, distillers dried grains, soya bean meal, wheat bran, brewers dried grains, malt sprouts, corn gluten meal, copra oil meal, corn meal, Iodol fish meal, molasses, calcium carbonate and salt.

**Overall 24% Dairy Ration**

Corn gluten feed, linseed oil meal, cottonseed meal, distillers dried grains, wheat bran, wheat middlings, corn gluten meal, hominy feed, calcium carbonate and salt.

**Top Notch 16% Ration**

Corn distillers grains, ground barley, malt sprouts, linseed oil meal, cottonseed meal, fine ground grain screenings, soya bean meal, molasses, calcium carbonate and salt.

**Yankee Dairy Ration**

Corn gluten feed, cottonseed meal, wheat bran, wheat middlings, corn gluten meal, soya bean meal, linseed oil meal, ground oats, corn meal, brewers grains, molasses, calcium carbonate and salt.

**George H. Parker Grain Co.****Parker's Egg Mash**

Yellow corn meal, wheat bran, wheat middlings, ground oats, feeding oat meal, dried skimmed milk, meat scraps, fish meal, alfalfa leaf meal, edible bone meal, calcium carbonate, charcoal, vitamin tested cod liver oil, and salt.

**Parker's Special Dairy Ration**

Wheat bran, yellow corn meal, hominy, old process linseed meal, soya bean meal, oat feed, corn gluten feed, cottonseed meal, molasses, calcium carbonate, steamed bone meal, and salt.

**W. N. Potter Grain Stores, Inc.****A. D. P. 24% Dairy Ration**

Ground corn, hominy, cottonseed meal, corn gluten meal, wheat bran, ground oats, oil meal, calcium carbonate, bone meal and salt.

**Potter's Sweetened Dairy Ration**

Gluten feed, hominy, linseed oil meal, ground oats, wheat bran, std. wheat middlings, cottonseed meal, corn distillers grains, molasses, calcium carbonate, bone meal and salt.

**H. C. Puffer Co.****Egg-Em-On Growing Feed**

Corn feed meal, corn gluten feed, ground barley, ground oats, wheat bran, wheat middlings, meat scraps, dried milk, alfalfa meal.

**Egg-Em-On Laying Mash**

Dried milk, dried fish, meat scraps, wheat bran and wheat middlings (not exceeding mill run of screenings), corn feed meal, corn gluten feed, ground oats, linseed meal, alfalfa meal, small percentage salt and calcium carbonate.

**Egg-Em-On Starting Mash**

Corn meal, wheat bran, wheat middlings, red dog middlings, ground oat groats, dried milk (skim or buttermilk), alfalfa leaf meal, fish meal, meat scraps, dicalcium phosphate, cod liver oil, calcium carbonate and salt.

**Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, corn gluten meal, ground oats, corn feed meal or hominy meal, wheat bran and wheat middlings (not exceeding mill run of screenings), small percentage salt and calcium carbonate.

**Sweetened Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, corn gluten meal, corn feed meal or hominy meal, wheat bran and wheat middlings (not exceeding mill run of screenings), oat feed, molasses, small percentage salt and calcium carbonate.

**Quaker Oats Co.****Quaker 16% Protein Dairy Ration**

Hominy feed, yellow hominy feed, cottonseed meal, soybean oil meal, corn gluten feed, wheat bran, wheat standard middlings, ground grain screenings from wheat, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% iodized ground limestone, molasses.

**Quaker Ful-O-Pep Egg Mash**

Oatmeal, hominy feed, yellow hominy feed, wheat bran, wheat standard middlings, barley meal, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Quaker Ful-O-Pep Growing Mash**

Oatmeal, yellow hominy feed, wheat bran, wheat standard middlings, barley meal, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Ralston Purina Co.****Protina 20% Dairy Feed**

Linseed meal, soy bean oil meal, cottonseed meal, gluten feed, wheat middlings (standard), alfalfa meal, wheat bran, ground grain screenings (from wheat, corn, oats, barley kafir), molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Protina 16% Dairy Feed**

Linseed meal, soy bean oil meal, gluten feed, alfalfa meal, wheat middlings (standard), cottonseed meal, molasses, ground grain screenings (from wheat, corn, oats, barley, kafir), wheat bran, 2% calcium carbonate (limestone), 1% iodized salt.

**Purina Blue Checker Cow Chow (20%)**

Dried beet pulp, linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, wheat middlings (standard), wheat bran, corn meal, alfalfa meal, molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Purina Body Cow Chow**

Cottonseed meal, corn gluten feed, wheat middlings (standard), corn meal, wheat bran, ground grain screenings (from wheat, corn, oats, barley, kafir), molasses, 3% calcium carbonate (limestone), 1% iodized salt.

**Purina Chick Growena**

Dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, wheat germ, alfalfa meal, corn meal, beet pulp, grey wheat middlings, wheat bran,  $1\frac{1}{2}\%$  calcium carbonate (limestone),  $\frac{1}{2}\%$  iodized salt, Pur-A-Tene (Pro-vitamin A-Carotene).

**Purina Chick Startena**

Dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, alfalfa leaf meal, wheat germ, linseed meal, corn germ meal, oat middlings, corn meal, wheat bran, grey wheat middlings,  $1\frac{1}{2}\%$  calcium carbonate (limestone),  $\frac{1}{2}\%$  iodized salt, Pur-A-Tene (Pro-vitamin A-Carotene).

**Purina Chicken Fatena**

Ground oats, ground corn, corn germ meal, wheat flour (second clear), grey wheat middlings, linseed meal, meat scrap, rolled oats,  $\frac{1}{2}\%$  iodized salt.

**Purina Egg Chowder**

Dried buttermilk, cod liver oil, sardine oil, meat scrap, soy bean oil meal, linseed meal, alfalfa meal, corn germ meal, grey wheat middlings, wheat bran, corn meal, 1% iodized salt, 3% calcium carbonate (limestone), Pur-A-Tene (Pro-vitamin A-Carotene).

**Purina Green Checker Cow Chow (24%)**

Linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, wheat middlings (standard), wheat bran, alfalfa meal, molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Purina Growing Chow**

Dried buttermilk, meat scrap, fish meal, soy bean oil meal, wheat germ, corn germ meal, grey wheat middlings, wheat bran, alfalfa meal, corn meal, 3% calcium carbonate (limestone), 1% iodized salt, Pur-A-Tene (Pro-vitamin A-Carotene).

**Purina Lay Chow**

Dried buttermilk, cod liver oil, sardine oil, meat scrap, soy bean oil meal, linseed meal, alfalfa meal, corn germ meal, wheat middlings (standard), wheat bran, corn meal, molasses, 1% iodized salt, 3% calcium carbonate (limestone), Pur-A-Tene (Pro-vitamin A-Carotene).

**Purina Layena (Complete Ration)**

Dried buttermilk, cod liver oil, sardine oil, meat scrap, soy bean oil meal, alfalfa meal, wheat middlings (standard), wheat bran, beet pulp, corn meal,  $\frac{1}{2}\%$  iodized salt, 4% calcium carbonate (limestone), Pur-A-Tene (Pro-vitamin A-Carotene).

**Purina Turkey Growing & Fattening Chow**

Meat scrap, soy bean oil meal, alfalfa meal, corn meal, wheat middlings (standard), wheat bran, molasses,  $\frac{1}{2}\%$  iodized salt, Pur-A-Tene (Pro-vitamin A-Carotene).

**Purina Turkey Startena**

Dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, alfalfa leaf meal, wheat germ, oat middlings, corn meal, soy bean oil meal, grey wheat middlings, wheat bran,  $\frac{3}{4}\%$  iodized salt, Pur-A-Tene (Pro-vitamin A-Carotene).

**D. F. Riley****Riley's Laying Mash**

Wheat middlings, wheat bran, yellow corn meal, gluten feed, ground oats, beef scraps, fish meal, dried skim milk, o. p. oil meal, alfalfa leaf meal, calcium carbonate, salt, fortified cod liver oil.

**Riley's 20% Ration**

Gluten feed, wheat middlings, linseed oil meal, 41% cottonseed meal, wheat bran, dried brewer's grains, corn meal or hominy, bone meal, salt.

**R. W. Ropes****Ropes Balanced Ration**

Corn meal, hominy, gluten meal and feed, cotton seed meal, bran, oil meal, beet pulp, alfalfa meal, oat feed, oat meal, molasses, edible bone meal, calcite flour, salt.

**Ropes Sweet Ration**

Hominy, bran, cotton seed meal, oat feed, gluten feed, gluten meal, rye meal, corn meal, alfalfa meal, molasses, calcium carbonate, salt.

**Ryther & Warren****Blue Tag Dairy Ration**

41% cottonseed meal, old process linseed oil meal, corn gluten feed, white hominy (or corn meal), standard bran, standard middlings, ground oats, dried beet pulp, calc. carbonate 1 per cent and salt,  $\frac{1}{2}$  of per cent.

**Minot Chick Mash, Starting and Growing Feed**

Yellow corn meal, wheat bran, flour middlings, ground oat meal, meat scraps 50% pro., fish meal 55% pro., alfalfa leaf meal, shell meal, dried milk, salt, Nopco XX cod liver oil.

**Minot Milk Egg Mash**

Yellow corn meal, wheat bran, flour middlings, ground 40-lb. oats, meat scraps 50% pro., fish meal 55% pro., alfalfa leaf meal, shell meal, dried milk, salt, Nopco XX cod liver oil.

**Minot Poultry Mash**

Wheat bran, wheat middlings, red dog middlings, corn meal, gluten feed, alfalfa meal, ground oats, meat scraps, fish meal,  $\frac{1}{2}$  of 1 per cent salt.

**Minot Special Dairy Ration**

Wheat bran, ground oats, gluten feed, 41% cottonseed meal, hominy feed (or corn meal), dried brewers grains, oil meal, rye feed, salt and lime.

**St. Albans Grain Co.****Hygrade 24 Sweetened Milk Ration**

Corn gluten meal, corn gluten feed, old process linseed meal, soybean oil meal, cottonseed meal, brewers' dried grains, corn meal, hominy feed, ground oats, ground barley, wheat bran, wheat middlings, calcium carbonate, dairy salt and pure cane molasses.

**Hygrade 20 Sweetened Milk Ration**

Old process linseed meal, soybean oil meal, cottonseed meal, brewers' dried grains, corn gluten meal, corn gluten feed, corn meal, hominy feed, ground oats, ground barley, wheat bran, wheat middlings, pure cane molasses, calcium carbonate and dairy salt.

**Utility Dairy Ration**

Old process linseed meal, soybean oil meal, corn gluten feed, cottonseed meal, corn meal, hominy feed, ground oats, ground barley, brewers' dried grains, oat meal mill by-products (oat middlings, oat shorts, oat hulls), wheat bran, wheat middlings, calcium carbonate, pure cane molasses and dairy salt.

**Wirthmore Baby Chick Starter**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), alfalfa leaf meal, fish meal, meat scraps, corn gluten meal, soybean oil meal, old process linseed oil meal, pure wheat bran, pure wheat middlings, ground hulled oats, ground wheat, yellow corn meal, corn germ meal, calcium carbonate and salt.

**Wirthmore 25 Balanced Ration Sweetened**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, brewers' dried grains, ground oats, cottonseed meal, corn gluten feed, yellow corn meal, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

**Wirthmore Complete Chick and Broiler Ration**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), ground oat groats, meat scraps, fish meal, alfalfa leaf meal, old process linseed oil meal, corn gluten meal, soybean oil meal, yellow corn meal, wheat bran, wheat middlings, calcium carbonate and salt.

**Wirthmore Complete Growing Ration**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, soybean oil meal, corn gluten meal, ground yellow corn, ground wheat, ground oats, ground barley, wheat bran, wheat middlings, alfalfa leaf meal, calcium carbonate and salt.

**Wirthmore Complete Laying Ration**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, whole oat groats, ground yellow corn, ground oats, alfalfa leaf meal, ground wheat, wheat bran, wheat middlings, calcium carbonate and salt.

**Wirthmore 20 Dairy Feed**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, ground oats, wheat middlings, wheat bran, edible bone meal and dairy salt.

**Wirthmore 20 Dairy Feed Sweetened**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, brewers' dried grains, cottonseed meal, corn gluten feed, yellow corn meal, ground oats, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

**Wirthmore Laying Mash**

Dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, alfalfa meal, linseed meal, soybean oil meal, corn gluten meal, wheat bran, wheat middlings, ground wheat, oats, barley, buckwheat, calcium carbonate and salt.

**Wirthmore Pellets**

Dried skim milk, meat scraps, soybean oil meal, corn germ meal, feeding oat meal, wheat bran, wheat middlings, wheat red dog flour, yellow corn meal, alfalfa meal, calcium carbonate, salt, cod liver oil, molasses.

**Wirthmore Turkey Growing Ration**

Fortified cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, soybean oil meal, alfalfa meal, yellow corn meal, fine ground oats, barley, wheat, wheat bran, wheat middlings, wheat flour middlings, calcium carbonate and salt.

C. H. Symmes

**The Ideal Dairy Ration**

Wheat middlings, wheat bran, brewers grains, cottonseed meal, linseed meal, gluten meal, gluten feed, corn meal or hominy, salt, molasses, bone meal, calcium carbonate, ground barley.

Syracuse Milling Co.

**Syracold Dairy Feed, Sweetened**

Corn meal, ground oats, wheat bran and wheat middlings with mill run screenings, toasted wheat feed (wheat and wheat bran processed), corn gluten feed, linseed meal, cottonseed meal, soy bean oil meal, distillers' dried grains, brewers' dried grains, molasses, calcium carbonate and salt.

Tioga-Empire Feed Mills, Inc.

**E-Gee Dairy Feed**

Cane molasses, wheat bran, wheat middlings, corn distillers grains, corn gluten feed, palm kernel oil meal, coconut oil meal, cottonseed meal, peanut oil meal, soybean oil meal, malt sprouts, brewers dried grains, salt, phosphate of lime, charcoal, iodine. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Neverfail Full Feed**

Wheat middlings, wheat bran, hominy feed, corn meal, soybean oil meal, corn gluten meal, pulverized oats, fish meal, meat and bone scrap, dried skim milk, phosphate of lime, cod liver oil, ground wheat, alfalfa leaf meal, calcium carbonate, salt. (Wheat middlings and wheat bran may contain ground screenings not exceeding mill run.)

**Red Brand Tioga Dairy Feed**

Cottonseed meal, corn gluten feed, wheat bran, wheat middlings, cane molasses, coconut oil meal, palm kernel oil meal, brewers dried grains, malt sprouts, soybean oil meal, peanut oil meal, corn distillers grains, salt, phosphate of lime, charcoal, iodine. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Ti-O-Ga Laying Food**

Wheat middlings, corn meal, wheat bran, pulverized oats, fish meal, soybean oil meal, corn gluten meal, meat and bone scrap, dried skim milk, phosphate of lime, linseed oil meal, hominy feed, alfalfa leaf meal, calcium carbonate, salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

United Cooperative Farmers, Inc.

**United Farmers Milk Pep**

Choice cottonseed meal, old pro. linseed meal, choice yellow hominy, corn gluten feed, pure gr. oats (No. 2-38 cl-un), soy bean oil meal, stand. wheat bran, corn dist. dried grains, molasses, steamed bone meal, calcium carbonate, salt.

**United Farmers Milkmaker**

Choice yel. hominy, pure gr. oats (No. 2-38 cl-un), stand. wheat bran, choice cottonseed meal, old pro. linseed oil meal, corn gluten feed, soy bean oil meal, molasses, corn dist. dried grains, steamed bone meal, calcium carbonate, salt.

Unity Feeds, Inc.

**Paymaster 20% Dairy Ration**

Distillers dried grains, corn gluten feed, soya bean meal, brewers dried grains, malt sprouts, linseed oil meal, cottonseed meal, wheat bran, wheat middlings, corn meal, molasses, calcium carbonate and salt.

**Unity Laying Mash**

Dried buttermilk, alfalfa leaf meal, soya bean meal, fish meal, meat scraps, linseed oil meal, wheat bran, wheat middlings, ground oats, ground wheat, corn meal, calcium carbonate and salt.

C. P. Washburn Co.

**"Made-Right" Balanced Ration**

Cottonseed meal, linseed oil meal, corn gluten, wheat bran, corn meal, oat feed, beet pulp, charcoal, calcium carbonate, salt, bone meal, ground oats, soya bean meal, brewers grains.

**"Made Right" Complete Layer**

Fortified cod liver oil, dried milk, corn meal, bran, middlings, oat meal, high grade meat scraps, fish meal, ground wheat, soya bean meal, gluten, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, minerals, iron oxide, iodine.

**"Made Right" Sweet Dairy Feed**

Corn meal, wheat meal, ground oats, cottonseed meal, linseed oil meal, wheat bran, soya bean meal, gluten, molasses, bone meal, calcium carbonate, salt, brewers grain.

**"Made Right" Dry Mash**

Corn meal, wheat bran, wheat middlings, red dog, 2nd clear flour, gr. oatmeal, linseed oil meal, gluten feed, soya bean meal, ground wheat, meat scraps, fish meal, dried skim milk, alfalfa leaf meal, molasses, charcoal, calcium carbonate, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

**"Made Right" Starting and Growing Feed**

Corn meal, wheat bran, wheat middlings, oat meal, gluten meal, red dog, 2nd clear flour, meat scraps, gr. wheat, soya bean meal, fish meal, dried skim milk, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

Wayne County Grangers Feed Corp.

**Sweetened 16% Dairy Feed**

Choice c/s meal, 34% oil meal, corn gluten feed, re-cleaned grain screenings, wheat bran, grd. oats, corn meal, malt sprouts, cane molasses, cocoa meal, 1% salt, essential minerals, soybean oil meal, iodine, iron sulphate, bone charcoal.

**Galen 24% Dairy Feed**

Corn gluten feed, choice c/s meal, brewers grains, wheat bran (may contain screenings), malt sprouts, grd. oats, soybean oil meal, hominy feed and corn meal, cane molasses, cocoa oil meal, steam bone meal, grd. limestone, 1% salt.

**Superior Growing Mash**

Cornmeal, hominy feed, soybean oil meal, oatmeal, ground barley, wheat bran (may contain screenings), flour midds, buttermilk, alfalfa leaf meal, meat scrap, fish meal, cod liver oil USP, essential minerals, iodine, iron sulphate, calcium carbonate, bone charcoal, iodine potassium, salt.

**Superior Laying Mash**

Meat scrap, bone meal, fish meal, buttermilk, cod liver oil, grd. corn, wheat, oats, barley, red dog wheat flour, wheat bran, wheat middlings (may contain screenings), corn gluten feed, alfalfa meal,  $\frac{1}{2}$  of 1% salt, essential minerals, iodine, iron sulphate, calcium carbonate, bone charcoal.

H. K. Webster Co.

**Blue Seal Breeders' Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground heavy oats, ground rolled oats, ground barley, corn gluten meal, 50% meat scraps, dried skim milk, 55% codfish meal, alfalfa leaf meal, salt, calcium carbonate, cod liver oil.

**Blue Seal Chick Starter**

No. 2 yellow corn meal, ground fancy wheat, fine ground heavy oats, ground barley, corn gluten meal, pure wheat bran, wheat flour middlings, high grade meat scraps, dried skim milk, 55% codfish meal, alfalfa leaf meal, calcium carbonate, salt, cod liver oil.

**Blue Seal College Mash Fortified with Cod Liver Oil**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, fine ground heavy oats, 50% meat scraps, 55% codfish meal, alfalfa leaf meal, dried skim milk, calcium carbonate, salt, cod liver oil.

**Blue Seal "20" Dairy Ration**

Old process linseed oil meal, soy bean oil meal, ground oats, malt sprouts, gluten feed, choice cottonseed meal, hominy feed, wheat bran, corn distillers' grains, brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate and salt).

**Blue Seal Egg Mash**

Corn meal, fine ground heavy oats, pure wheat bran, pure wheat middlings, high grade meat scraps, dried skim milk, alfalfa leaf meal, P. R. cane molasses, gluten meal, calcium carbonate, salt, cod liver oil.

**Blue Seal Growing Mash**

Dried skim milk, dried buttermilk, h. g. meat scraps, 55% fish meal, alfalfa leaf meal, gluten meal, No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground oats, ground barley, P. R. cane molasses, calcium carbonate, salt, cod liver oil.

**Blue Seal Hom-Mix 24% Dairy Ration**

Choice cottonseed meal, soy bean oil meal, malt sprouts, gluten meal, oat feed, wheat bran, hominy feed, peanut skins, germs and meal, linseed oil meal, dried brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, and salt).

**Blue Seal Improved All-Mash Ration**

Coarse ground No. 2 yel. corn, ground fancy wheat, fine ground heavy oats, pure wheat bran, wheat flour middlings, h. g. meat scraps, 55% codfish meal, dried skim milk, alfalfa leaf meal, P. R. cane molasses, calcium carbonate, salt, cod liver oil.

**Blue Seal Improved Balanced Ration**

Old process linseed oil meal, soy bean oil meal, ground oats, malt sprouts, gluten meal, choice cottonseed meal, hominy feed, wheat bran, corn distillers' grains, dried brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate and salt).

**Blue Seal Special 20% Dairy Ration**

Choice cottonseed meal, soy bean oil meal, malt sprouts, gluten feed, oat feed, wheat bran, hominy feed, peanut skins, germs and meal, linseed oil meal, dried brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate and salt).

**West-Nesbitt, Inc.****Pure Feed Egg Mash**

Corn meal, oat flour, wheat bran, wheat flour middlings, leaf alfalfa meal, dried skim milk, meat scraps, fish meal, steamed bone meal, 1% calcium carbonate, cod liver oil, kelp meal.

**Special 20 Per Cent Dairy Ration**

Choice 41% cottonseed meal, soyabean meal, corn gluten feed, corn gluten meal, rye distillers grains, corn meal, wheat bran, oatmeal mill by-product (oat middlings, oat shorts, oat hulls), pure cane molasses, 1% steamed bone meal, 1% calcium carbonate,  $\frac{1}{2}$  of 1% salt. Bran may contain screenings not to exceed mill run.

**Super Pure Sweetfeed Dairy Ration**

Corn gluten feed, corn distillers' dried grains, soya bean meal, choice cottonseed meal, old process linseed oil meal, wheat bran, hominy or corn meal, pure cane molasses, 1% steamed bone meal, 1% calcium carbonate,  $\frac{1}{2}$  of 1% salt. Bran may contain screenings not to exceed mill run.

**Est. M. G. Williams****Williams Balanced Ration**

Corn meal or hominy, linseed oil meal, cotton seed meal, ground oats, gluten feed, dried brewers grains, wheat feed, calcium carbonate and salt.

**Williams Laying Mash**

Corn meal, bran, middlings, ground oats, meat scraps, leaf meal, dried skim milk, calcium carbonate, salt and cod liver oil.

**Stanley Wood Grain Co.****Bliss Dairy Ration**

Corn meal (or hominy), cottonseed meal, wheat bran, linseed meal, wheat middlings, gluten meal, gluten feed, table salt, edible bonemeal, calcium carbonate, (beet pulp).

**Preferred Laying Mash**

Pure dried skim milk, dried fish meal, alfalfa leaf meal, beef scraps, yellow corn meal, wheat bran, pulverized oats, wheat middlings, edible bonemeal, table salt, calcium carbonate.

**Woods Dairy Ration**

Cottonseed meal, wheat middlings, yellow corn meal, old process linseed oil meal, corn gluten feed, dried beet pulp, wheat bran, salt, calcium carbonate.

### Acid Insoluble Ash in Linseed Meal.

The definition for linseed meal as adopted by the Association of Feed Control Officials requires that linseed meal shall contain not more than 0.5 percent of acid insoluble ash.

Acid insoluble ash determinations were made on 25 samples of linseed meal collected by the feed control inspector during the season of 1934-1935. The average content of all samples collected was 0.76 per cent. The maximum amount found was 2.05 per cent; the minimum, 0.08 per cent. It is obvious that no particular attempt is being made to limit the insoluble ash content of linseed meals. It may be that the limit of 0.5 per cent as given in the definition is too high for linseed meal derived from certain sources.

### Linseed Meals, Insoluble Ash.

Manufacturer and Brand.	Number of Samples.	Insoluble Ash.		
		Maximum Per Cent.	Minimum Per Cent.	Average Per Cent.
<b>Archer-Daniels-Midland Co.</b>				
34% Protein . . . . .	3	2.05	0.90	1.29
32% Protein . . . . .	2	0.70	0.15	0.43
<b>Bisbee Linseed Co.</b>				
34% Protein . . . . .	1	—	—	0.43
<b>Hirst &amp; Begley Linseed Works</b>				
37% Protein . . . . .	1	—	—	0.23
<b>Kelloggs &amp; Miller, Inc.</b>				
K & M 34% Protein . . . .	5	1.85	0.65	1.22
<b>Spencer Kellogg &amp; Sons, Inc.</b>				
Kellogg's 34% Protein . . .	5	1.00	0.10	0.33
Kellogg's 32% Protein . . .	7	1.60	0.20	0.83
<b>Sherwin Williams Co.</b>				
SWC 34% Protein . . . . .	1	—	—	0.08



## Average Analyses of Unmixed By-Products.

(Collected between September 1, 1934, and April 1, 1935)

	Num- ber of Samples.	Water (Per Cent).	Protein (Per Cent).	Fat (Per Cent).	Nitro- gen Free Extract (Per Cent).	Fiber (Per Cent).	Ash (Per Cent).
Cottonseed Meal . . .	52	7.3	40.6	6.7	28.8	9.8	6.8
Linseed Meal . . .	26	8.6	35.2	5.5	56.7	8.0	6.0
Soy Bean Oil Meal . .	10	8.2	43.4	5.5	31.3	5.0	6.6
Gluten Meal . . .	16	8.2	45.0	1.5	41.7	2.1	1.5
Gluten Feed . . .	51	9.6	28.1	2.4	46.9	6.7	6.3
Wheat Standard Middlings	27	9.4	19.1	5.7	54.2	7.2	4.4
Wheat Flour Middlings .	11	9.8	18.9	4.7	57.3	5.2	4.1
Red Dog Flour . . .	10	10.3	17.8	3.7	62.8	2.8	2.6
Wheat Mixed Feed . .	63	9.5	17.9	4.5	56.4	6.9	4.8
Wheat Bran . . .	61	8.9	17.4	4.9	53.1	9.9	5.8
Rye Feed . . .	5	9.1	14.4	2.9	66.6	3.8	3.2
Corn Meal . . .	35	11.0	10.3	5.0	69.9	2.2	1.6
Ground Oats . . .	60	9.1	13.4	4.0	60.2	9.9	3.4
Hominy Feed . . .	38	8.9	11.8	7.5	64.5	4.6	2.7
Dried Beet Pulp . . .	12	8.7	9.1	0.4	59.2	19.4	3.2

## TINNED DOG FOODS.

Numerous requests for information about canned foods has led us to sample the brands commonly found on the Massachusetts markets. No attempt is made to compare their relative value except as is indicated by their analyses. Anyone attempting to evaluate material of this character is handicapped at the outset by the lack of uniformity of opinion as to what constitutes a satisfactory tinned dog food. However, enough difference has been found in them to allow for a wide latitude in choice.

In every case the analyses were made of one purchased can. While the point may be raised that a single can may not be truly representative of the brand as a whole, it is believed that where care is taken in making a uniform product, a one-can sample should be as satisfactory as several.

While no attempt was made to determine the condition of the material used, all samples examined were uniformly free from disagreeable taint or odor.



## Tinned Dog Foods

Chemical Analyses and Weights (as Sold).

Manufacturer and Brand.	Water Per Cent.	Protein Per Cent.		Fat Per Cent.		Nitrogen Free Extract Per Cent.	Fiber Per Cent.		Ash Per Cent.	Weight Per Can.		Water Free Material Per Can Pounds.
		Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.		Found Pounds.	Guar- anteed.	
California Animal Products Co., Oakland, Cal. Calo Dog Food . . . . .	74.09	7.21	—	2.36	—	13.24	0.46	—	2.64	1.022	1 lb.	0.265
Chapel Bros. Inc., Rockford, Ill. Hemo-Ration . . . . .	70.72	12.01	—	2.03	—	12.81	0.31	—	2.12	1.006	1 lb.	0.295
Ken-I-Ration . . . . .	66.64	12.36	10.00	3.92	2.00	12.15	0.50	2.00	4.42	0.990	1 lb.	0.330
Naro-Meat . . . . .	64.48	17.47	—	5.00	—	7.23	0.13	—	5.69	1.012	1 lb.	0.359
Doyle Packing Co., Los Angeles, Cal. Strongheart Meat Rations . . . . .	81.92	5.17	7.02	1.69	3.90	9.78	0.79	0.50	0.65	0.998	15¾ oz. <sup>1</sup>	0.180
Empire Beef & Provision Co., Chicago, Ill. Ideal Dog Food . . . . .	69.21	11.80	10.00	6.61	2.00	9.82	0.33	1.00	2.14	0.986	1 lb.	0.308
Imperial Pet Foods Inc., Sackets Harbor, N. Y. Imperial Dog Food . . . . .	71.08	7.72	7.00	2.29	1.75	15.90	0.61	1.75	1.68	0.976	15½ oz. <sup>2</sup>	0.282
John Morrell & Co., Ottumwa, Iowa Red Heart—Diet A—Beef added . . . . .	72.71	14.09	—	5.72	—	5.04	0.26	—	2.18	1.004	1 lb.	0.274
Red Heart—Diet B—Fish added . . . . .	71.85	14.56	—	5.83	—	4.97	0.37	—	2.42	0.978	1 lb.	0.275
Red Heart—Diet C—Cheese added . . . . .	71.64	13.33	—	7.00	—	5.12	0.39	—	2.52	1.006	1 lb.	0.285
Old Mother Hubbard Dog Food Co., Gloucester, Mass. Old Mother Hubbard Terrier Ration . . . . .	63.00	12.98	—	13.56	—	3.73	0.37	—	6.36	1.008	1 lb.	0.373
Old Trusty Dog Food Co., Needham Heights, Mass. Old Trusty Boxer Dog Food . . . . .	71.84	11.28	10.00	6.74	2.00	9.01	0.34	2.00	0.79	0.998	1 lb.	0.281
Rath Packing Co., Waterloo, Iowa Dog-Gon Good Dog Food . . . . .	73.99	12.05	—	3.31	—	8.57	0.34	—	1.74	1.008	1 lb.	0.262
Republic Food Products Co., Chicago, Ill. Vim Dog Food . . . . .	76.64	10.58	10.50	2.86	3.00	8.79	0.46	0.50	0.67	0.956	15½ oz. <sup>2</sup>	0.223



## Analyses of Dog Foods.

(Calculated to a Dry Matter Basis.)

Brand.	Protein Per Cent.	Fat Per Cent.	Nitrogen Free Extract. Per Cent.	Fiber Per Cent.	Ash Per Cent.
Calo Dog Food . . . . .	27.84	9.11	51.09	1.78	10.18
Hemo-Ration . . . . .	41.03	6.92	43.75	1.05	7.25
Ken-L-Ration . . . . .	37.06	11.75	36.41	1.51	13.27
Maro-Meat . . . . .	49.19	14.08	20.33	0.37	16.03
Strongheart Meat Ration . . . .	28.62	9.31	54.06	4.39	3.62
Ideal Dog Food . . . . .	38.61	21.47	31.91	1.06	6.95
Imperial Dog Food . . . . .	27.37	8.12	56.39	2.16	5.96
Red Heart—Diet A . . . . .	51.62	21.08	18.39	0.94	7.97
Red Heart—Diet B . . . . .	51.73	20.71	17.64	1.32	8.60
Red Heart—Diet C . . . . .	47.01	24.67	18.09	1.36	8.87
Old Mother Hubbard Terrier Ration	35.09	36.66	10.05	1.01	17.19
Old Trusty Bovex Dog Food . . .	40.07	23.93	31.98	1.20	2.82
Dog-Gon Good Dog Food . . . .	46.34	12.72	32.96	1.30	6.68
Vim Dog Food . . . . .	45.35	12.27	37.53	1.98	2.87
Rex Dog Food . . . . .	27.74	5.02	60.16	3.68	3.40
Evr Redy Dog Food . . . . .	32.57	21.47	26.31	1.56	18.09
Rival Dog Food . . . . .	45.79	11.67	37.56	1.28	3.70
Dr. Ross Vitamin Dog Food . . .	45.39	7.75	42.11	1.09	3.66
Sandy's Dog Food . . . . .	27.39	21.80	47.48	0.99	2.34
Mankind Dog Food . . . . .	36.61	27.08	30.31	1.66	4.34
Doggie Dinner . . . . .	30.18	9.16	54.26	1.15	5.25
Pard Dog Food . . . . .	40.75	13.79	34.92	1.56	8.98
Silver Fur Food . . . . .	39.91	18.99	30.12	2.00	8.98
Victory Dog & Cat Food . . . .	25.93	14.22	47.38	2.94	9.53
Vitamont Blue Ribbon Dog Food .	47.96	17.45	31.05	1.11	2.43

## Interpretation of Chemical Analyses.

**Protein.** High protein indicates high meat content.

**Fat.** High fat indicates an admixture of considerable animal fat.

**Nitrogen free extract.** When high, indicates a high vegetable or cereal content; when low, a more liberal meat or meat product content.

**Fiber.** Found only in the vegetable or cereal products used.

**Ash.** Derived from meat, bone, or to a lesser degree from the cereal and vegetable products used. High ash content indicates a liberal admixture of bone or the addition of mineral substances in an attempt to create a better mineral balance.

**Chemical Guarantees.** Of the twenty-five samples of dog food examined, fourteen carried protein, fat, fiber and carbohydrate guarantees. It is doubtful if the analysis of the product is a deciding factor in its purchase. The dog owner will probably tend to base his conclusions as to relative desirability upon price, palatability, and the resulting condition of the animal fed. On none of them was there a statement of maximum water content, which is probably as important as any other one factor in fixing their real value.

**Weights.** The net weight of the contents of each can was determined by weighing on delicate scales, cleaning and drying the empty can which was then weighed and the result deducted from the original gross weight. On the whole the cans were found to contain full weight, although the water-free weight showed wide variations. The practice of putting up slightly less than one pound in a can, although the weight is correctly stated on the label, is not to be commended.

**Ingredients.** A statement of the ingredients used in making tinned dog foods may prove of interest. These are given as stated on the label and no attempt was made to identify the material either by chemical or microscopic means.

**Calo Dog Food**

Fresh meat, barley, carrots, bone meal, cod liver oil, salt and charcoal.

**Hemo-Ration**

Meat, blood, cereal and cod liver oil.

**Ken-L-Ration**

Horse meat products, wheat, rolled oats, rice, cod liver oil.

**Marro-Meat**

Horse meat and bone, horse marrow fat, cereal and charcoal.

**Strongheart Meat Ration**

Meat, cereals, vegetables, charcoal.

**Ideal Dog Food**

Meat by-products, meat, rice, wheat, ground bone, carrots, salmon, cod liver oil.

**Imperial Dog Food**

Beef, salmon, oatmeal, bran, cod liver oil, barley, alfalfa, bone, charcoal, powdered milk, wheat, onions, carrots, salt.

**Red Heart—Diet A**

Meat food product, with cereals and vegetables, beef added.

**Red Heart—Diet B**

Meat food product, with cereals and vegetables, fish added.

**Red Heart—Diet C**

Meat food product, with cereals and vegetables, cheese added.

**Old Mother Hubbard Terrier Ration**

Beef, carrots, rice.

**Old Trusty Bovex Dog Food**

Meat by-products, meat, rice and wheat.

**Dog-Gon Good Dog Food**

Carries no statement of ingredients except that it is "A Meat Food Product."

**Vim Dog Food**

Meat food products, wheat and vegetables.

**Rex Dog Food**

Cereals, beef and beef products, charcoal, meat broth.

**Evr Redy Dog Food**

Beef, meat food products, wheat, rolled oats, rice, cod liver oil.

**Rival Dog Food**

Meat product with rolled oats, barley and vegetable flour.

**Vitamin Dog and Cat Food**

Lean meat, glandular tissues, shredded wheat, cod liver oil, sea vegetables, calcium, sodium, phosphorus.

**Sandy's Dog Food**

A meat food product (cereal or vegetable content not stated on label).

**Mankind Dog Food**

Meat, cracked barley, shorts.

**Doggie Dinner**

Beef products, rice, barley, oats, carrots, cod liver oil, charcoal, bone meal.

**Parl Dog Food**

Meat by-products, meats, wheat, barley, dry skimmilk, tomatoes, bone, salt, cod liver oil.

**Silver Fur Food**

Meat by-products, wheat, dry skimmilk, tomatoes, bone meal, salt.

**Victory Dog & Cat Food**

Meat, cereals, vegetables, cod liver oil.

**Vitamont Dog Food**

Beef and horse meat product (cereal or vegetable content not stated on label).

A statement of the ingredients used in the making of tinned dog foods is not required by Massachusetts statutes. Where used, the statement should be in such form as to be readily understood by the purchaser. The omission of such a statement renders it more difficult for the buyer to evaluate the product he proposes to use.

## Directory of Manufacturers Who Registered Feeding Stuffs for Sale in Massachusetts in 1935.

Acorn Feed & Hominy Co., P. O. Box 898, Cumberland, Md.  
 Albers Bros. Milling Co., Seattle, Wash.  
 E. T. Allen Co., P. O. Box 951, Atlanta, Ga.  
 Allied Mills, Inc., Chicago, Ill.  
 American Maize-Products Co., 100 East 42nd St., New York, N. Y.  
 A. P. Ames Co., Peabody, Mass.  
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.  
 Archer-Daniels-Midland Co., Minneapolis, Minn.  
 Ashcraft-Wilkinson Co., Atlanta, Ga.  
 W. E. Atkinson Co., 27 Water St., Newburyport, Mass.  
 Edward R. Bacon Grain Co., Boston, Mass.  
 E. W. Bailey & Co., Montpelier, Vt.  
 Balfour, Guthrie & Co., Ltd., Balfour Bldg., San Francisco, Cal.  
 Barber & Bennett, Inc., Albany, N. Y.  
 Beacon Milling Co., Inc., Cayuga, N. Y.  
 Berkshire Coal & Grain Co., North Adams, Mass.  
 Bisbee Linseed Co., 2100 Lincoln Liberty Bldg., Philadelphia, Penn.  
 Borden Co., 350 Madison Ave., New York, N. Y.  
 Borden Grain Co., Taunton, Mass.  
 Bradley & Baker, 155 East 44th St., New York, N. Y.  
 C. W. Brister & Son, Auburn, N. Y.  
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Company of North America.)  
 Brown & Bailey Condensed Milk Co., Nevins & Butler Streets, Brooklyn, N. Y.  
 Geo. B. Brown, Ipswich, Mass.  
 Buckeye Cotton Oil Co., Cincinnati, Ohio.  
 C. F. Buell, Inc., 6 Beacon St., Boston, Mass.  
 C. W. Burckhalter, Inc., 177 Franklin St., New York, N. Y.  
 Burrus Mill & Elevator Co., Kingfisher, Okla.  
 Butman Feed Co., Lynn, Mass.  
 Cairo Meal & Cake Co., Cairo, Ill.  
 A. B. Caple Co., Sta. A, Box 27, Toledo, Ohio.  
 Center Milk Products Co., Middlebury Center, Penn.  
 Central Chemical Co., Baltimore Trust Bldg., Baltimore, Md.  
 Central Soya Co., Inc., Decatur, Ind.  
 Chapin & Co., Hammond, Ind.  
 Checkerboard Feed Store, Oswego, N. Y. (Registered by Ralston Purina Co.)  
 S. J. Cherry & Sons, Ltd., Preston, Ont., Canada.  
 Clinton Co., Clinton, Iowa.  
 Clyde-Renco-Milling Corp., Clyde, N. Y.  
 Coatsworth and Cooper, 67 Yonge St., Toronto, Ont., Canada.  
 Collis Products Co., St. Paul, Minn.  
 Commander-Larabee Corp., Minneapolis, Minn.  
 Community Feed Stores, Inc., South Deerfield, Mass.  
 G. E. Conkey Co., Cleveland, Ohio.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Consumers Import Co., Inc., 115 Broad St., New York, N. Y.  
 Continental Distilling Corp., 260 South Broad St., Philadelphia, Penn.  
 Copeland Flour Mills, Ltd., Midland, Ont., Canada.  
 Corn Products Refining Co., 17 Battery Place, New York, N. Y.  
 Nicolas Courcy, 11 Waverly St., Taunton, Mass.  
 Cover & Palm Co., 150 Middle St., Lowell, Mass.  
 E. A. Cowee Co., Fitchburg, Mass.  
 Curley Brothers, Main St., Wakefield, Mass.  
 Cutler Co., North Wilbraham, Mass. (Registered by St. Albans Grain Co.)  
 Dairymen's League Co-operative Assn., Inc., 11 West 42nd St., New York, N. Y.  
 Decatur Milling Co., Inc., Decatur, Ill.  
 Delaware Mills, Inc., Deposit, N. Y.  
 Denver Alfalfa Milling & Products Co., Lamar, Col.  
 Dewey Bros. Co., Blanchester, Ohio.  
 Frank Diauto, 87 Warren St., Randolph, Mass.  
 F. Diehl & Son, Inc., Wellesley, Mass.  
 Dietrich & Gambrill, Inc., Frederick, Md.  
 Eagle Roller Mill Co., New Ulm, Minn.  
 East Bridgewater Farmers Exchange, Inc., East Bridgewater, Mass.  
 Eastern Grain Co., Bridgewater, Mass.  
 Eastern States Farmers' Exchange, Springfield, Mass.  
 Michael W. Ellis, 19 Walnut St., Peabody, Mass.  
 Elm City Creamery, Inc., 3 Pleasant St., Fairhaven, Mass.  
 Elmore Milling Co., Inc., Oneonta, N. Y.  
 John W. Eshelman & Sons, Lancaster, Penn.  
 Evans Milling Co., Indianapolis, Ind.  
 Excelsior Milling Co., 712 Flour Exchange, Minneapolis, Minn.  
 Fairchild Milling Co., 1635 Merwin St., Cleveland, Ohio.  
 Fairmont Creamery Co., Omaha, Neb.  
 Farm Service Stores, Inc., Industrial Bldg., Boston, Mass.  
 Farmers Feed Co., 532 East 76th St., New York, N. Y.  
 Fernando Valley Milling & Supply Co., 336 I. W. Hellman Bldg., Los Angeles, Cal.  
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.  
 Flory Milling Co., Inc., Bangor, Penn.  
 J. A. Forrest, Minneapolis, Minn. (Registered also for Western Canada Flour Mills Co., Ltd.)  
 Fred A. Fountain, 355 Tremont St., Taunton, Mass.  
 Framingham Grain Co., Waverly St., Framingham, Mass.  
 Dean S. French, West Stoughton, Mass.  
 Paul Fuller & Sons, 8 Mooney Ave., Salem, Mass.

Fullerton Grain Co., Brockton, Mass.  
 J. B. Garland & Son, Worcester, Mass.  
 General Commodity Corp., Buffalo, N. Y.  
 General Mills, Inc., Minneapolis, Minn.  
 W. K. Gilmore & Sons, Inc., Walpole, Mass.  
 Goode Grain Co., 452 Broadway, Lowell, Mass.  
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.  
 Grand Union Co., 233 Broadway, New York, N. Y.  
 D. H. Grandin Milling Co., Jamestown, N. Y.  
 Great Atlantic & Pacific Tea Co., 1104 Hodgson Bldg., Minneapolis, Minn.  
 Green Acre Farms, Nazareth, Penn.  
 Hales & Hunter Co., 166 West Jackson Blvd., Chicago, Ill.  
 Frank B. Ham & Co., Ltd., 1506 Royal Bank Bldg., Toronto, Canada.  
 Wm. Hamilton & Son, Inc., Caledonia, N. Y.  
 Dwight Hamlin Co., Diamond Bank Bldg., Pittsburgh, Penn.  
 D. Harbeck, 105 Earl St., New Bedford, Mass.  
 Hecker-H-O Co., Inc., Genesee Bldg., Buffalo, N. Y.  
 Hecker-Jones-Jewell Milling Div. of Standard Milling Co., 503 Seneca St., Buffalo, N. Y.  
 W. D. Higgins Co., Framingham, Mass.  
 Hirst & Begley Linseed Works, 2013 Mendel St., Chicago, Ill.  
 D. B. Hodgkins' Sons, Gloucester, Mass.  
 Hood Mills Co., 423 W. Pratt St., Baltimore, Md.  
 Horvitz Grain Co., 742 Acushnet Ave., New Bedford, Mass.  
 R. B. Howlett, Amherst, Mass.  
 Hubinger Co., Keokuk, Iowa.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 International Milling Co., Minneapolis, Minn.  
 Jaquith & Co., 305 Main St., Woburn, Mass.  
 Jersee Co., Minneapolis, Minn.  
 Joslin-Schmidt Corp., Lockland Sta., Cincinnati, Ohio.  
 Kansas Flour Mills Corp., Kansas City, Mo.  
 Kasco Mills, Inc., Waverly, N. Y.  
 Kellogg Co., Battle Creek, Mich.  
 Kellogg Co. of Canada, Ltd., London, Ont., Canada.  
 Kelloggs & Miller, Inc., Amsterdam, N. Y.  
 Spencer Kellogg & Sons, Inc., Buffalo, N. Y.  
 Kimbell-Diamond Milling Co., Fort Worth, Texas.  
 H. H. King Flour Mills Co., 1010 Chamber of Commerce, Minneapolis, Minn.  
 Kraft-Phenix Cheese Corp., 400 Rush St., Chicago, Ill.  
 Chas. A. Krause Milling Co., Milwaukee, Wis.  
 Lakeside Milling Co., Ltd., Ft. Princess St., Toronto, Ont., Canada.  
 J. T. Lampman & Co., Claverack, N. Y.  
 Larowe Milling Co., Box 68, North End Sta., Detroit, Mich.  
 L. B. Lovitt & Co., Memphis, Tenn.  
 A. S. MacDonald Commission Co., 404 Grain & Flour Exchange, Boston, Mass. (Registered for  
 Parrish & Heimbecker, Ltd.)  
 Maine Fish Meal Co., Portland, Maine.  
 Mann Bros. Co., Buffalo, N. Y.  
 Mansfield Milling Co., Mansfield, Mass.  
 Maple Leaf Milling Co., Ltd., Toronto, Canada. (Registered by Traders Feed & Grain Co., Inc.)  
 Maritime Milling Co., Inc., Buffalo, N. Y.  
 Mellin's Food Company of North America, 41 Central Wharf, Boston, Mass. (Registered for  
 A. H. Brown & Bros.)  
 Merrimack Farmers' Exchange, Inc., Concord, N. H.  
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.  
 Monti-Van Iderstine, Inc., 272 Hudson Ave., Brooklyn, N. Y.  
 Geo. Q. Moon & Co., Inc., Binghamton, N. Y.  
 Jas. F. Morse & Co., Somerville, Mass.  
 Moseley & Motley Milling Co., Mill St., foot of Brown St., Rochester, N. Y.  
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.  
 National Mineral Products Co., Ltd., 830 7th St., San Francisco, Cal.  
 New England Brewery & Distillery Grain Co., Phoenix Ave., Lowell, Mass.  
 New England Chemical Industries, Inc., Woburn, Mass.  
 New England Dairies, Inc., 51 Cornhill, Boston, Mass.  
 New England Rendering Co., Rear 39 Market St., Brighton, Mass.  
 Niagara Falls Milling Co., Lockport, N. Y.  
 Northwestern Consolidated Milling Div. of Standard Milling Co., 1013 Metropolitan Life Bldg.,  
 Minneapolis, Minn.  
 Nowak Milling Corp., Hammond, Ind.  
 Ogden Grain Co., Utica, N. Y.  
 Pacific Bone Coal & Fertilizing Co., San Francisco, Cal. (Affiliate of New England Chemical  
 Industries, Inc.)  
 Philip R. Park, Inc., Naval Station, San Pedro, Cal.  
 Park & Pollard Co., 356 Hertel Ave., Buffalo, N. Y.  
 George H. Parker Grain Co., Danvers, Mass.  
 Parrish & Heimbecker, Ltd., Toronto, Ont., Canada. (Registered by A. S. MacDonald Com-  
 mission Co.)  
 Patent Cereals Co., Geneva, N. Y.  
 Penick & Ford Ltd., Inc., Cedar Rapids, Iowa.  
 Pillsbury Flour Mills Co., Minneapolis, Minn.  
 Maurice Pincoffs Co., 410 M & M Bldg., Houston, Texas.  
 Postum Co., Inc., Battle Creek, Mich.  
 W. N. Potter Grain Stores, Inc., Greenfield, Mass.  
 Pratt Food Co., Elk St. & Abbott Rd., Buffalo, N. Y.  
 H. C. Puffer Co., Springfield, Mass.  
 Quaker Oats Co., 141 West Jackson Blvd., Chicago, Ill.  
 Queensboro Farm Products, Inc., 35-13 41st St., Long Island City, N. Y.  
 Ralston Purina Co., St. Louis, Mo. (Registered also for Checkerboard Feed Stores.)  
 John Reardon & Sons Co., Cambridge A, Mass.  
 D. F. Riley, North Hatfield, Mass.

Robin Hood Mills, Ltd., Moose Jaw and Calgary, Canada.  
 R. W. Ropes, 5 Hobart St., Danvers, Mass.  
 N. Roy & Son, Rear 618 Newport Ave., South Attleboro, Mass.  
 H. M. Rubin Co., Inc., 38 Ave. & 10 St., Long Island City, N. Y.  
 Russell-Miller Milling Co., Minneapolis, Minn.  
 Ryther & Warren, Belchertown, Mass.  
 St. Albans Grain Co., St. Albans, Vt. (Registered also for Cutler Co., and Taft Bros.)  
 St. Lawrence Flour Mills Co., Ltd., 2110 Notre Dame St. West, Montreal, Canada.  
 Seaboard Western Grain Corp., 2 Broadway, New York, N. Y.  
 Sheffield Farms Co., Inc., 524 West 57th St., New York, N. Y.  
 Smith Bodfish Swift Co., Vineyard Haven, Mass.  
 James H. Smith, 102 Hale St., Haverhill, Mass.  
 Sperry Flour Co., San Francisco, Cal.  
 A. E. Staley Manufacturing Co., Decatur, Ill.  
 State Mill & Elevator, Grand Forks, N. Dak.  
 F. W. Stock & Sons, Hillsdale, Mich.  
 Stratton & Co., Concord, N. H.  
 Swift & Co. Oil Mill, Columbia, S. C.  
 C. H. Symmes, Winchester, Mass.  
 Syracuse Milling Co., Syracuse, N. Y.  
 Taft Bros., Uxbridge, Mass. (Registered by St. Albans Grain Co.)  
 Texas Star Flour Mills, Galveston, Texas.  
 Tioga Mills, Inc., Waverly, N. Y. (Formerly Tioga-Empire Feed Mills, Inc.)  
 Traders Feed & Grain Co., Inc., 736 Chamber Commerce, Buffalo, N. Y. (Registered for Maple Leaf Milling Co., Ltd.)  
 Transit Milling Co., Galveston, Texas.  
 Jacob Trinley & Sons, Linfield, Penn.  
 Twin City Milk Producers Assn., St. Paul, Minn.  
 Union Starch & Refining Co., Columbus, Ind.  
 United Cooperative Farmers, Inc., Fitchburg, Mass.  
 United Farmers' Cooperative Creamery Assn., Inc., 88 Cambridge St., Charlestown, Mass.  
 Unity Feeds, Inc., 177 Milk St., Boston, Mass.  
 Upper Hudson Rye Flour Mills, Inc., 7 Madison St., Troy, N. Y.  
 Van Vechten Milling Co., Inc., 196 Smith St., Rochester, N. Y.  
 Victor Flour Mills, Inc., Pittsford, N. Y.  
 Waddington Milk Co., Inc., 102-106 West 24th St., New York, N. Y.  
 C. P. Washburn Co., Middleboro, Mass.  
 Wayne County Grangers Feed Corp., Clyde, N. Y.  
 H. K. Webster Co., Lawrence, Mass.  
 West-Nesbitt, Inc., Oneonta, N. Y.  
 Western Canada Flour Mills Co., Ltd., Calgary, Canada. (Registered by J. A. Forrest.)  
 Whiting Milk Companies, 570 Rutherford Ave., Boston, Mass.  
 Wilber Feed Co., Inc., Jamestown, N. Y.  
 Est. M. G. Williams, Box 603, Taunton, Mass.  
 Wilmington Packing Co., New Boston St., Woburn, Mass.  
 Wilson & Co., 41st St. and So. Ashland Ave., Chicago, Ill.  
 Stanley Wood Grain Co., Taunton, Mass.  
 Worcester Grain & Coal Co., Worcester, Mass. (Registered one brand for Jersee Co.)

MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN NO. 80

NOVEMBER, 1935

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Seed Inspection

By F. A. McLaughlin

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This Report, the eighth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1935 by the Commissioner of Agriculture, who is named in the Act as Administrative Officer (Acts and Resolves of 1927, Chapter 274.)

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Massachusetts State College  
Amherst, Mass.



## ANNOUNCEMENT

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any resident firm or citizen of Massachusetts.

Units are rated as follows:

Units

Purity analysis (red clover, timothy, etc.).....	1
Purity analysis (bluegrass, orchard grass, etc.).....	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture).....	4-10
Examination for noxious weeds (4 oz. or fraction thereof) of samples not mixtures.....	1
Examination for noxious weeds (4 oz. or fraction thereof) of mixtures.....	4-10
Identification of seed or plant.....	1
Cleaning tobacco seed (4 oz. or fraction thereof).....	2
Germination tests (4 x 100 seeds, of any seed not chaffy or requiring a purity test).....	1
Germination tests (soil, 2 x 100 seeds).....	1
Germination tests (chaffy grasses or seeds requiring purity analysis) .....	2-4

Fees for work in excess of the ten free units allowed are as follows:

- Germination test except for grasses other than timothy, but including clovers and alfalfa, thirty cents each.
- Germination tests of grasses except timothy, fifty cents each.
- Purity analyses of cereals, fifty cents each.
- Purity analyses of timothy, and all other kinds of crop seeds, except grasses, seventy-five cents each.
- Purity analyses of grasses and of all mixtures of not more than two kinds of agricultural seeds, one dollar each.
- Purity analyses of special mixtures, including lawn grasses and pasture mixtures, a charge sufficient to cover the actual cost of working the sample, the amount of such fee depending entirely upon the character of the sample submitted for test, minimum charge one dollar and twenty-five cents.

In no case will final report be rendered until all fees are paid.

# SEED INSPECTION

By F. A. McLaughlin<sup>1</sup>

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This bulletin gives the results of analysis of official seed samples collected by the State Department of Agriculture, during the year 1935, from the open markets in 63 towns and cities of Massachusetts and analyzed at the Seed Testing Laboratory of the Massachusetts Agricultural Experiment Station at Amherst. Between October 1, 1934, and October 1, 1935, the Seed Laboratory analyzed 1,151 samples, of which 743 were collected by the State Department of Agriculture and 408 submitted by dealers and farmers. In addition, 205 ingredients found in the special mixtures were given viability tests as a check on the quality of seeds used in these mixtures during 1935. The total number of samples worked in the laboratory, therefore, really amounts to 1,356 without taking into account many retests which were necessary as a check-up on questionable viability of many kinds of seeds which were submitted to us for retests.

This bulletin also contains results of field tests for trueness to type of 207 lots of the following vegetables: beans, beets, carrots, cucumbers, lettuce, onions, parsnips, radishes, spinach, squash, sweet corn and turnips.

## SUMMARY OF RESULTS

### **Alfalfa to Timothy**

The following table of analysis, covering 209 samples of seed in this group, continues to show, as in former years, that the most common violation of the seed law is the lack of certain required information on the label. This information was lacking, wholly or in part, for 85 samples (40.66%). Other deficiencies shown are 35, or 16.74%, below in germination; 9, or 4.30%, with excessive weed seed; and 21, or 10.05%, below in purity. In all, 126 samples (60.29%) of this group either did not comply with the label requirements or were not up to the guarantee, even when proper tolerance allowances were made.

### **Mixtures of Not More Than Two Lots of Seeds**

No samples declared as such were taken by inspectors. One, however, sold under the special mixture clause contained but two kinds of seed and should have been labeled as such. The table shows this sample otherwise deficient.

### **Special Mixtures**

In this group 45 samples were analyzed, of which 20 (44.44%) complied with the requirements of the law in every respect and the remaining 25 were only partially labeled or were found deficient in other respects.

Although the law does not require the label to show the germination of the various kinds of seed used in this group, a germination test was made for each kind of seed declared or found in excess of 5% in each of the 45 samples of mixtures analyzed. The following table shows the results of these tests:

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<sup>1</sup>Assisted by Miss Olive M. Hoefle, appointed Technical Assistant March 11, 1935.

Number Tested	Name of Seed	Germination, Percent		
		Lowest	Highest	Average
38	Kentucky Bluegrass.....	10	80	57.18
20	Timothy.....	32	89	70.75
30	White Clover.....	39-14	89-1	76-6
20	Chewing's Fescue.....	10	81	38
6	Rough Stalked Meadow Grass.....	34	57	47
33	Redtop.....	66	95	82.58
9	Canada Bluegrass.....	44	80	69.33
29	Domestic Ryegrass.....	59	98	90.31
1	Meadow Fescue.....		80	
1	Fine Leaved Fescue.....		40	
1	Crested Dog's-tail.....		82	
1	Perennial Ryegrass.....		94	
3	Red Fescue.....	7	70	32

Although many of the samples contained seed of high quality in both purity and germination, the low germination shown for ingredients of many samples indicates clearly the use of low-grade seed. In other instances, low germination appears to be due to age rather than to poor quality. This is most often due to the fact that the mixtures had been held in stock several years by the retailer before a sample was taken by an inspector.

Low germination of Chewing's Fescue may be expected sometimes two or three months from the date when the mixture is made. Because this seed loses viability oftentimes in a relatively short period of time, the purchaser will do well, when using this seed in mixtures, to have his mixture made to order rather than to select a ready-made mixture containing Chewing's Fescue.

As a protection to the public, the mixture section of the law should be amended to require that the label show approximate percentage of each kind of seed used in the mixture; the germination of each kind of seed; and the year and month when the test was made.

### Vegetable Seeds

All of the 489 samples of vegetable seed tested under this section of the law lived up to the label requirements which, in Massachusetts, do not require a statement of germination or the year and month in which a germination test was made. Although much of this seed, as shown by germination tests, was of excellent quality, 149 samples (30.47%) gave a germination below the standards required by law in many states (see Control Bulletin 56, 1930, p. 4). The quality of seed is shown to be slightly better than that of the 1934 inspection, in which 38.2% fell below standard. Yet the fact remains that much of the seed sold in Massachusetts is not of the desired high quality. Probably very little improvement can be expected until the present law is amended to require that a statement of the germination and the date when this test was made be placed upon the container in which vegetable seeds are offered for sale. Such a requirement should make the retailer more cautious about offering for sale old seed which he has held for several seasons, and at the same time give the purchaser an opportunity to note the age and performance of the seed from an examination of the label.

### Explanation of the Tables

In these tables the seeds are listed in alphabetical order by groups, each group containing only those seeds, the sale of which is regulated by a definite section

of the Massachusetts Seed Law. Section 261-A of the Acts and Resolves of 1927, Chapter 274, defines the group from Alfalfa to Timothy, inclusive; Section 261-B, Mixtures; Section 261-C, Special Mixtures; and Section 261-D, Vegetables.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F", what was found in the laboratory analysis. Attention is called to certain irregularities by the following:

The asterisk (\*) shows violation in labeling.

Boldface type indicates low purity, low germination, excessive weed seed, noxious weeds not declared, or excessive inert material, depending upon the column in which it is found.

Other deficiencies are enumerated as follows:

- (1) Noxious weeds found.
- (2) Old seed (as shown by given date or by correspondence with the wholesaler).
- (3) Ingredient found, but not declared.
- (4) Ingredient declared, but not found.
- (5) Ingredient declared, but percentage found after adding proper tolerance is less than 5%.
- (6) Term not specific.

The letter "R" after the germination percentage in the table of vegetable seeds indicates that the sample has received one or more retests.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except in those tables which list seeds falling under sections of the law not requiring purity or germination on the label. For the application of "Purity Tolerance", the sample is considered as made up of two component parts: (1) the component being considered, and (2) the balance of the sample. The tolerance in percentage allowed for each component shall be two-tenths of one per cent (0.2%) plus twenty per cent (20%) of the lesser of the two parts. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

<i>Given Germination</i>	<i>Allowable Variation (%)</i>
90 or over.....	6
80 or over, but less than 90.....	7
70 or over, but less than 80.....	8
60 or over, but less than 70.....	9
Less than 60.....	10



ROSS BROS. CO., Worcester, Mass.  
White Hull-less.....L.  
Ross Bros. Co., Worcester.....F.

## BENT GRASS

THOMAS W. EMERSON CO., Boston, Mass.

70 Colonial Bent (2).....L.  
Hutchinson Hardware Co., Lynn.....F.

HOVEY & CO., Boston, Mass.

818 Astoria Bent (Certified Seaside Bent).....L.  
Hovey & Co., Boston.....F.

STANFORD SEED CO., Buffalo, N. Y.

163 German Bent No. 6780\* (Contains also Agrostis alba, redtop, and Agrostis tenuis, var. Astoria Bent).....L.  
Carlisle Hardware Co., Springfield.....F.

WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.

52 South German Bent—Creeping\* (contains also Agrostis tenuis var. Astoria Bent; Agrostis maritima, Seaside Bent; and a trace of Agrostis alba, redtop).....L.  
Foster-Farrar, Northampton.....F.

T. W. WOOD & SONS, Richmond, Va.

172 Astoria Bent Grass, No. 603.....L.  
H. C. Puffer, Springfield.....F.

## BLUEGRASS

JOSEPH BRECK AND SONS CORP., Boston, Mass.

88 Kentucky Bluegrass.....L.  
C. Skelton & Sons, Newton Centre.....F.

617 Kentucky Bluegrass, No. 032565.....L.  
Farm Service Stores Inc., Waltham.....F.

ALBERT DICKINSON CO., Chicago, Ill.

168 Kentucky Bluegrass, No. 032588.....L.  
H. C. Puffer, Springfield.....F.

648 Kentucky Bluegrass (2).....L.  
Prentiss Brooks & Co., Holyoke.....F.

THOMAS W. EMERSON CO., Boston, Mass.

221 Kentucky Bluegrass (Gem).....L.  
Elwood Adams Inc., Worcester.....F.

227 Kentucky Bluegrass.....L.  
Frank Howard Inc., Pittsfield.....F.

205 Ross Bros. Co., Worcester, Mass.  
White Hull-less.....L.  
Ross Bros. Co., Worcester.....F.

## BENT GRASS

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Elwood Adams Inc., Worcester.....F.

227 Kentucky Bluegrass.....L.  
Frank Howard Inc., Pittsfield.....F.

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>BLUEGRASS—Concluded</b>							
278	Kentucky Bluegrass. A. T. Chase Corp., Dedham	* 74.13	* .71	— 24.92	— .24	* 10(R)	* 4/35
397	Kentucky Bluegrass. Lawson Paint & Seed Co., Brockton..	* 75.60	* .65	— 23.64	— .11	* 75	* 5/35
207	ROSS BROS. CO., Worcester, Mass. Canada Bluegrass (1) (28 Canada thistle per oz.) Ross Bros. Co., Worcester	L. 84.74 83.09	.38 .30	— 14.05	— 2.56	89 87	1/35 7/35
240	STANFORD SEED CO., Buffalo, N. Y. Kentucky Bluegrass, Lot No. 4868. Clark Hardware Co., Greenfield	L. 77.98 80.97	.73 1.07	— 17.34	— .62	81 84	1/34 7/35
51	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Kentucky Bluegrass. Foster Farrar, Northampton	L. 84.78 84.99	.63 .49	— 14.42	— .10	75 71	* 5/35
69	Kentucky Bluegrass. Hutchinson Hardware Company, Lynn	L. 81.45	* .20	— 17.90	— .45	* 81	* 5/35
130	Kentucky Bluegrass. J. Russell & Co., Holyoke	L. 85 86.26	.21 .11	— 11.51	— .12	80 64(R)	4/34 7/35
165	Kentucky Bluegrass. Carlisle Hardware Co., Springfield	L. 80 77.40	.55 .45	— 22.04	— .11	75 72	1/35 7/35
<b>BUCKWHEAT</b>							
104	JOSEPH BRECK & SONS, Boston, Mass. Japanese Buckwheat. Joseph Breck & Sons, Boston	* 99.94	* .00	— .06	— .00	* 95	12/34 6/35
811	ALBERT DICKINSON CO., Chicago, Ill. Japanese Buckwheat. Thomas J. Grey Co., Boston	L. 98.8 98.97	.10 .05	— .80	— .18	96 94	2/34 6/35
614	THOMAS W. EMERSON CO., Boston, Mass. Buckwheat (6) (Japanese Buckwheat). Thomas W. Emerson Co., Boston	L. 98 99.52	* .00	— .28	— .20	95 91	* 6/35

## LARROWE BUCKWHEAT FLOUR CORP.

190 Buckwheat (6) (Japanese Buckwheat)..... L. 99.72 \* 94 \* /34  
 Frank Howard Inc., Pittsfield..... F. 99.86 .00 97 6/35

## ROSS BROS. CO., Worcester, Mass.

208 Japanese Buckwheat..... L. 99.26 \* 91 3/35  
 Ross Bros. Co., Worcester..... F. 99.90 .00 83(R) 6/35

## ALSIKE CLOVER

## THOMAS W. EMERSON CO., Boston, Mass.

396 Alsike Clover..... L. \* 96.60 \* 40-1 \*  
 Lawson Paint & Seed Co., Brockton..... F. .25 .30 5/35

## WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.

369 Alsike Clover..... L. 98.62 .44 80-13 2/35  
 Farm Service Stores, Middleboro..... F. 98.62 .21 81-8 5/35

## RED CLOVER

## ALLIED SEED CO., Fort Wayne, Ind.

547 Medium Red Clover..... L. 99.50 .14 85-2 3/35  
 Sunshine Feed Store, Greenfield..... F. 99.57 .12 92-1 7/35

## ALBERT DICKINSON CO., Chicago, Ill.

531 Medium Red Clover, No. 241295..... L. 98.36 .26 81-10 11/34  
 North Adams Flour & Grain Co., North Adams..... F. 99.06 .06 92-3(R) 7/35

## Medium Red Clover, No. 24-5191.....

537 Berkshire Coal & Grain Co., North Adams..... L. 99.25 .16 88-9 2/35  
 Berkshire Coal & Grain Co., North Adams..... F. 99.52 .19 89-4 7/35

## Red Clover.....

634 Prentiss Brooks & Co., Holyoke..... L. 99.08 .24 88-6 4/34  
 Prentiss Brooks & Co., Holyoke..... F. 99.37 .23 94-3 6/35

## THOMAS W. EMERSON CO., Boston, Mass.

233 Medium Red Clover..... L. 99.22 .22 91 11/34  
 Frank Howard Inc., Pittsfield..... F. 99.41 .18 84-10 6/35

## Red Clover.....

277 A. T. Chase Corp., Dedham..... L. \* 98.30 \* 39-4(R) 4/35  
 A. T. Chase Corp., Dedham..... F. .74 .52 \* 5/35

## Red Clover.....

395 Lawson Paint & Seed Co., Brockton..... L. \* 98.06 1.36 59-7(R) 5/35  
 Lawson Paint & Seed Co., Brockton..... F. .19 .39 \* 11/34

## Red Clover.....

512 O. B. Parks Co., Westfield..... L. 99.22 .22 96 11/34  
 O. B. Parks Co., Westfield..... F. 99.40 .12 88-4 7/35



## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Crop Seed %	Other %	Germi- nation %	Date of Test
RED CLOVER—Concluded								
605	Red Clover Medium. Thomas W. Emerson Co., Boston	L. 99 F. 97.66	.22 .82	.17	—	1.35	91 78-3(R)	* 7/35
140	STANFORD SEED CO., Buffalo, N. Y. Red Clover. George Methle Co., Springfield	L. 99.01 F. 98.68	.21 .45	.14	—	.73	89-6½ 80-16(R)	3/35 5/35
164	Red Clover, No. 6692. Carlisle Hardware Co., Springfield	L. * F. 99.20	* .22	.20	—	.38	* 87-6	* 7/35
195	Red Clover, No. 6691 (2). A. E. Sherman, Lanesboro	L. 99.50 F. 99.36	* .08	.39	—	.17	93-4 83-4(R)	12/33 7/35
9	N. WERTHEIMER & SONS, Ligonier, Ind. Medium Red Clover No. 203 (Matrix). Ware Grain & Coal Co., Ware	L. 98.52 F. 97.28	.06 .12	.18 .65	—	1.24 1.95	90 91-4	1/35 4/35
58	Medium Red Clover, No. 221. W. N. Potter Grain Store, Northampton	L. 99.07 F. 99.15	.65 .44	.24 .38	—	.04 .03	85-7 79-8	*3/35 7/35
503	Medium Red Clover, Matrix. Smith Feed Co., Westfield	L. 98.52 F. 98.94	.06 .17	.18 .25	—	1.24 .64	90 89	* 7/35
527	Medium Red Clover. Cutler Grain & Coal Co., Palmer	L. 95.66 F. 94.70	.24 1.27	.70 1.03	—	.00 3.00	95 87-1(R)	2/35 7/35
17	WHITNEY-BECKSTEIN SEED CO., Buffalo, N. Y. Pan American Domestic Red Clover. Foster Farrar, Northampton	L. 99.42 F. 97.62	.22 1.32	.21	—	.85	89-5 82-4(R)	3/34 5/35
136	Red Clover. The Wells Hardware Co., Holyoke	L. 99 F. 98.11	.25 .38	.32	—	1.19	90 76-3	4/34 7/35
138	Red Clover. J. Russell & Co., Holyoke	L. * F. 99.65	* .09	.20	—	.06	* 86-1	*3/34 7/35
249	Fancy Red Clover. Cobb, Bates and Yerxa, Taunton	L. * F. 98.53	* .45	.57	—	.45	* 25-5(R)	* 4/35
368	Red Clover (2). Farm Service Stores, Middleboro	L. 99.34 F. 99.52	.16 .26	.12	—	.10	82-15 80-5	2/34 5/35

556	Medium Red Clover, Pan American (2) Clark Hardware Co., Greenfield	L. F.	99.22 99.16	.17 .09	— .21	.54 —	91 93-2	4/35 6/35
237	F. H. WOODRUFF & SONS, Milford, Conn. Red Clover, Peirson Hardware Co., Pittsfield	L.	* 98.68	* .15	— .83	.34 —	* 90-1	* 7/35 6/35
WHITE CLOVER								
336	ATLANTIC SEED CO., New York, N. Y. White Clover, Pebeco Hardware Sales Co., Wellesley	L. F.	98.4 98.20	.50 .54	.50 .36	.65 .90	92 76-7(R)	1/35 5/35
91	JOSEPH BRECK AND SONS CORP., Boston, Mass. White Clover, C. Skelton & Sons, Newton Centre	L. F.	* 98.58	* .32	— .43	.67 —	* 83-2(R)	* 7/35 7/35
450	White Clover, Sanborn & Damon Co., Quincy	L. F.	* 87.61	* 1.30	— 9.74	— 1.35	* 23-3	* 7/35
635	BARBER & BENNET INC., Albany, N. Y. White Clover (2), Prentiss Brooks & Co., Holyoke	L. F.	98.62 97.33	.36 .75	— .38	— 1.54	76 69-7	11/32 7/35
173	ALBERT DICKINSON CO., Chicago, Ill. White Clover, No. 76-42, H. C. Puffer, Springfield	L. F.	98.35 98.37	.40 .47	— .31	— .85	84-4 77-3	7/34 7/35
511	White Clover, O. B. Parks Co., Westfield	L. F.	* 94.91	* .35	— .52	— 4.22	* 63-7	* 7/35
231	THOMAS W. EMERSON CO., Boston, Mass. White Clover, Frank Howard Inc., Pittsfield	L. F.	99.30 98.59	.46 .41	— .64	— .36	93 79-11(R)	3/35 7/35
142	STANFORD SEED CO., Buffalo, N. Y. White Clover, No. 4799, George Methe Co., Springfield	L. F.	99.20 99	.18 .05	— .48	— .47	84.75-6 1/2 77-8	1/35 7/35
166	White Clover, No. 4799, Carlisle Hardware Co., Springfield	L. F.	99.20 97.81	.18 .79	— .16	— 1.24	84.25-6.50 77-8	1/34 7/35
62	N. WERTHEIMER & SONS, Ligonier, Ind. White Dutch Clover, W. N. Potter Grain Co., Northampton	L. F.	96.05 94.18	.70 2.20	2.35 3.05	.90 .57	90-3 63-21(R)	* 7/35
15	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. White Clover, Foster Farrar, Northampton	L. F.	98 97.43	.55 .36	— .46	— 1.75	75-15 75-11(R)	* 5/35

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>WHITE CLOVER—Concluded</b>							
128	White Clover..... The Wells Hardware Co., Holyoke	98.45 98.33	.45 .42	— .15	— 1.10	81 79-7(R)	3/34 5/35
129	White Clover..... J. Russell & Co., Inc., Holyoke	* 97.35	* .50	— .35	— 1.80	* 73-9(R)	* 5/35
414	Fancy White Clover..... Hutchinson Hardware Co., Lynn	98 97.82	.55 .34	.10 .63	— 1.21	75-15 74-11	1/35 7/35
236	F. H. WOODRUFF & SONS, Milford, Conn. White Clover..... Peirson Hardware Co., Pittsfield	* 97.78	* .53	— .96	— .73	* 73-7	* 3/35 7/35
618	WHOLESALER UNKNOWN White Clover..... Farm Service Stores Inc., Waltham	* 98.06	* .68	— .39	— .87	* 82-2	* 7/35
<b>FIELD CORN</b>							
564	ALLIED SEED CO., Fort Wayne, Ind. White Eureka, Virginia Grown..... Sunshine Feed Store, Greenfield	99 99.90	— .00	— .10	— .00	90 89	3/35 6/35
133	ALBERT DICKINSON CO., Chicago, Ill. Improved Leaming, No. 72342..... Prentiss Brooks & Co. Inc., Holyoke	99 99.40	— .00	— .60	— .00	90 90	2/35 5/35
514	Pine Tree, No. 72317..... O. B. Parks Co., Westfield	99 100	— .00	— .00	— .00	90 92	3/35 6/35
636	Longfellow Flint, No. 7226..... Prentiss Brooks & Co., Holyoke	99.50 100	— .00	— .00	— .00	90 88	2/35 5/35
637	West Branch Sweepstakes, No. 72331..... Prentiss Brooks & Co., Holyoke	99 100	— .00	— .00	— .00	95 89	2/35 5/35
565	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Lancaster Sure Crop..... Greenfield Farmers Cooperative Exchange, Greenfield	99.25 100	— .00	— .00	— .00	90 90	2/35 6/35

532	O. & M. SEED CO., Green Springs, Ohio Leaming.....	L. F.	99 100	— .00	— .00	— .00	92 90	* 5/35
540	North Adams Flour & Grain Co., North Adams Yellow Sweepstakes.....	L. F.	* 99.52	* .00	— .48	— .00	* 92(R)	* 6/35
199	STANFORD SEED CO., Buffalo, N. Y. C. P. Enslage.....	L. F.	98 99.98	— .00	— .02	— .00	93 90	* 6/35
170	A. E. Sherman, Lanesboro T. W. WOOD & SONS, Richmond, Va. White Dent Corn.....	L. F.	99 100	.10 .00	— .00	— .00	90 93	4/35 5/35
506	H. C. Puffer, Springfield WHOLESALE UNKNOWN Leaming, No. 5270.....	L. F.	99 99.98	— .00	— .00	— .00	92 91	3/35 6/35
545	Smith Feed Co., Westfield SMITH FEED CO., Westfield ALLIED SEED CO. INC., Philadelphia, Pa. Meadow Fescue.....	L. F.	97.11 98.34	.91 .69	1.94 .76	.04 .21	70 56(R)	2/35 6/35
167	Sunshine Feed Store, Greenfield BARBER & BENNETT INC., Albany, N. Y. Chewing's Fescue, No. F-267.....	L. F.	99.32 98.52	.03 .08	.65 1.40	.00 .00	76 40(R)	12/34 7/35
101	H. C. Puffer Co., Springfield JOSEPH BRECK & SONS CORP., Boston, Mass. Meadow (Tall) Fescue.....	L. F.	* 95.04	* .17	— 4.28	— .51	* 85(R)	1/35 7/35
106	Joseph Breck & Sons Corp., Boston Red Fescue.....	L. F.	* 87.31	* .78	— 11.26	— .65	* 50(R)	1/35 7/35
107	Joseph Breck & Sons, Boston Sheep's Fescue.....	L. F.	* 87.88	* .44	— 11.68	— .00	* 80	1/35 7/35
194	THOMAS W. EMERSON CO., Boston, Mass. Meadow Fescue.....	L. F.	99 98.14	* .91	— .88	— .07	97 81(R)	3/34 7/35
218	Frank Howard Inc., Pittsfield Chewing's Fescue.....	L. F.	95 97.26	.13 .09	— 2.46	— .19	55 38	11/34 6/35
228	Elwood Adams Inc., Worcester Chewing's Fescue.....	L. F.	97.17 97.25	.13 .12	— 2.59	— .04	78 45(R)	12/34 6/35
	Frank Howard Inc., Pittsfield							

## FESCUES

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>FESCUES—Concluded</b>							
606	Sheep's Fescue..... Thomas W. Emerson Co., Boston	87 87.44	.50 .30	— 12.24	— .02	60 51(R)	* 7/35
203	ROSS BROS. CO., Worcester, Mass. Meadow Fescue..... Ross Bros. Co., Worcester	97 97.15	1.75 1.79	— 1.01	— .05	90 94	7/34 5/35
214	Chewing's Fescue..... Ross Bros. Co., Worcester	98.20 98.33	* —	1.75 1.54	— .13	80 43(R)	10/34 6/35
67	WHITNEY-FCKSTEIN SEED CO., Buffalo, N. Y. Chewing's Fescue..... Hutchinson Hardware Co., Lynn	* 93.51	* .13	— 1.22	— 5.14	* 65	* 35 6/35
<b>MANGELS</b>							
105	JOSEPH BRECK & SONS, Boston, Mass. Long Red Mangel..... Joseph Breck & Sons, Boston	* 98.86	* —	— 1.14	— —	* 80	1/35 8/35
135	JEROME B. RICE SEED CO., Cambridge, N. Y. Wurzel Golden Tankard Mangel..... The Wells Hardware Co., Holyoke	* 98.15	* —	— 1.74	— .11	* 50(R)	* 7/35
711	Wurzel Beet Mangel..... Clark Hardware Co., Greenfield	* 99.40	* —	— .60	— —	* 82(R)	* 6/35
215	ROSS BROS. CO., Worcester, Mass. Mammoth Long Red Mangel..... Ross Bros. Co., Worcester	98.89 99.34	.02 .01	— .65	— —	86.5 84	1/35 5/35
722	F. H. WOODRUFF & SONS, Milford, Conn. Sugar Beet Mangel, Giant ½ Sugar Green Top..... Greenfield Farmers Cooperative Exchange, Greenfield	* 99.75	* —	— .25	— —	* 53(R)	* 35 6/35
<b>GOLDEN MILLET</b>							
522	ALBERT DICKINSON CO., Chicago, Ill. Golden Millet * Broomcorn Millet..... Cutler Grain & Coal Co., Palmer	* 98.25	* —	— 1.75	— —	* 89	* 7/35

ROSS BROS. CO., Worcester, Mass.  
Golden Millet \* German Millet  
Ross Bros. Co., Worcester

209 99.50 .05 — 90 12/34  
99.60 .04 .21 86 7/35

## HUNGARIAN MILLET

ALLIED SEED CO., Fort Wayne, Ind.  
Hungarian Millet, Indiana grown,  
Sunshine Feed Store, Greenfield

546 98.91 .55 — 90 2/35  
99.24 .19 .24 93 6/35  
.27

JOSEPH BRECK & SONS CORP., Boston, Mass.  
Hungarian Millet.  
Joseph Breck & Sons Corp., Boston

103 \* 99.25 .44 — 82(R) 1/35  
99.25 .03 87/35

PAGE SEED CO., Greene, N. Y.  
Hungarian Millet.  
Frank Howard Inc., Pittsfield

191 99.60 .18 — 82 2/35  
99.67 .19 .07 85 6/35

N. WERTHEIMER & SONS, Ligonier, Ind.  
Hungarian Millet, No. 34702.  
Ware Grain & Coal Co., Ware

11 99.56 .08 .30 92 3/35  
99.33 .24 .34 86 5/35

59 Hungarian Millet, No. 34702 (1) (4 Brassica arvensis and 1 Canada thistle per oz.)  
W. N. Potter Grain Store, Northampton

92 .06 .30 .06 92 3/35  
99.32 .13 .55 86(R) 5/35

499 Hungarian Millet, No. 34702  
Smith Feed Co., Westfield

92 .06 .30 .06 92 3/35  
99.49 .06 .37 91 7/35

WHITNEY- ECKSTEIN SEED CO., Buffalo, N. Y.  
Fancy Hungarian Millet.  
George Methe Co., Springfield

139 99 .04 — 90 1/35  
99.50 .26 .19 89(R) 6/35

541 Hungarian Millet.  
Berkshire Coal & Grain Co., North Adams

\* 99.37 .22 .31 79(R) \* 3/34  
7/35

649 Hungarian Millet.  
Prentiss Brooks & Co., Holyoke

99 .54 — 90 \* 7/35  
99.44 .36 .18 80(R)

F. H. WOODRUFF & SONS, Milford, Conn.  
Hungarian Millet.  
O. B. Parks, Westfield

507 \* 99.32 .41 — 87 1/35  
99.32 .04 .23 87 7/35

## JAPANESE MILLET

JOSEPH BRECK & SONS CORP., Boston, Mass.  
Japanese Millet.  
Joseph Breck & Sons Corp., Boston

102 \* 98.75 1.08 — 87 1/35  
98.75 .07 87 7/35

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Seed Test
JAPANESE MILLET—Concluded							
533	ALBERT DICKINSON CO., Chicago, Ill. Japanese Millet, No. 44112 (2). North Adams Flour & Grain Co., North Adams	L. 98.72 98.21	1.26 1.36	— .43	—	91 86	11/33 7/35
171	CRAVER, DICKINSON CO., Buffalo, N. Y. Japanese Millet. H. C. Puffer, Springfield	L. 99.50 99.75	.50 .05	— .18	— .02	85 94	3/35 7/35
193	PAGE SEED CO., Greene, N. Y. Japanese Millet. Frank Howard Inc., Pittsfield	L. 98.39 98.48	1.61 1.29	.27 .22	— .01	90 86	12/34 7/35
538	Japanese Millet, No. J5D35. Berkshire Coal & Grain Co., North Adams	L. 98.39 98	1.61 1.25	.27 .75	—	90 85	12/34 7/35
149	STANFORD SEED CO., Buffalo, N. Y. Japanese Millet, No. 171730. Charles E. Terry, West Springfield	L. 98.46 98.49 98.37	1.88 1.08 1.35 1.46	— .36 — .17	— .10 —	75 70 83 78(R)	1/35 7/35 4/35 7/35
6	Japanese Millet. A. E. Sherman, Lanesboro N. WERTHEIMER & SONS, Ligonier, Ind. Japanese Millet, No. 33703. Ware Grain & Coal Co., Ware.	L. 98.40 97.49	.76 .68	.76 1.81	.08 .02	88 82	1/35 5/35
504	Japanese Millet, No. 33703. Smith Feed Co., Westfield	L. 98.40 98.14	.76 .96	.76 .90	.08 —	88 82	1/35 7/35
526	Japanese Millet, No. 33701. Cutler Grain & Coal Co., Palmer	L. 98.66 98.79	.98 .89	.36 .32	—	70 90	2/35 7/35
92	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Japanese Millet. George Methe Co., Springfield	L. 97.39 98.36	1.70 1.30	— .34	—	87 80	1/35 7/35
647	Japanese Millet, No. 2325. Prentiss Brooks & Co., Holyoke	L. 96.71 98.97	3.02 .76	— .27	—	90 93	11/34 5/35

## OATS

180	BARBER & BENNETT INC., Albany, N. Y. New Seed Oats (6). Frank Howard Inc., Pittsfield	L. F.	96.50 96.18	.50 .52	2.50 2.95	95 97	4/35 6/35
589	CHARLES M. COX CO., Boston, Mass. Oats Seed (6). Knight Grain Co., Newburyport	L. F.	98 98.19	* .30	— 1.24	95 96	*3/35 6/35
812	ALBERT DICKINSON CO., Chicago, Ill. Oats (6). Thomas J. Grey Co., Boston	L. F.	99 97.67	.10 .30	— 1.76	99 94(R)	12/34 5/35
213	ROSS BROS. CO., Worcester, Mass. Swedish Oats. Ross Bros. Co., Worcester	L. F.	98 97.02	* .32	— 2.24	95 94	3/35 6/35
64	ST. ALBANS GRAIN CO., St. Albans, Vt. Fancy Seed Oats (6). W. N. Potter Grain Store, Northampton	L. F.	98 98.63	* .09	— 1.17	95 95	*3/35 5/35

## ORCHARD GRASS

398	THOMAS W. EMERSON CO., Boston, Mass. Orchard Grass. Lawson Paint & Seed Co., Brockton	L. F.	84 85.17	* .68	— 14.12	91 81(R)	* 6/35
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## CANADA FIELD PEAS

548	ALLIED SEED CO., Fort Wayne, Ind. Canada Field Peas. Sunshine Feed Co., Greenfield	L. F.	* 99.25	* —	— .02	* 90	* 7/35
543	BARBER & BENNETT INC., Albany, N. Y. Canada Field Peas, No. 87-211 (2). Berkshire Coal & Grain Co., North Adams	L. F.	99 99.23	— —	— .77	95 89	4/32 7/35
211	ROSS BROS. CO., Worcester, Mass. Canada Field Peas. Ross Bros. Co., Worcester	L. F.	99 99.94	— —	— .06	96 94	1/35 6/35
501	N. WERTHEIMER & SONS, Ligonier, Ind. Canada Field Peas, No. TM. Smith Feed Co., Westfield	L. F.	99 99.76	— —	— .24	94 91	1/35 6/35



## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>RAPE</b>							
544	ALLIED SEED CO., Fort Wayne, Ind. Dwarf Essex Rape (Japan grown) Sunshine Feed Store, Greenfield	* 99.89	* .00	— .11	— .00	* 84	2/35 6/35
202	THOMAS W. EMERSON CO., Boston, Mass. Dwarf Essex Rape Frank Howard Inc., Pittsfield	98 99.96	.50 .00	— .04	— .00	95 98	3/34 6/35
210	ROSS BROS. CO., Worcester, Mass. Dwarf Essex Rape Ross Bros. Co., Worcester	99.85 99.87	.01 .03	— .10	— .00	97 98	11/34 6/35
745	F. H. WOODRUFF, Milford, Conn. Dwarf Essex Rape D. J. Mahoney Hardware Co., Haverhill	* 99.80	* .01	— .19	— .00	* 87	* 6/35
<b>REDTOP</b>							
89	JOSEPH BRECK & SONS CORP., Boston, Mass. Recleaned Fancy Redtop C. Skelton & Sons, Newton Centre	90 89.71	* .96	— 7.97	— 1.36	90 84	1/35 6/35
343	Redtop William Westland, Quincy	* 97.14	* .46	— 2.38	— .02	* 96	* 6/35
372	Redtop The Welch Co., Scituate	* 90.54	* .94	— 7.59	— .93	* 79(R)	* 7/35
169	ALBERT DICKINSON CO., Chicago, Ill. Redtop, No. 41102 H. C. Puffer, Springfield	90.10 94.14	1.10 .99	— 4.75	— .12	87 89	4/35 7/35
534	Redtop, No. 30511 North Adams Flour & Grain Co., North Adams	95.40 94.34	.60 1.10	— 4.52	— .04	91 88(R)	9/34 6/35
536	Redtop, No. 04124 Berkshire Coal & Grain Co., North Adams	92 94.09	.90 .59	— 5.21	— .11	90 90	10/34 6/35
633	Redtop, No. 30322 Prentiss Brooks & Co., Holyoke	96.10 95.60	1.00 .62	— 3.75	— .03	90 88	4/34 5/35

219	THOMAS W. EMERSON CO., Boston, Mass. Redtop.....	L. F.	97.38 98.01	.44 .41	— 1.58	— —	92 91	11/34 6/35
232	Elwood Adams Inc., Worcester Redtop.....	L. F.	97.82 97.87	.30 .35	— 1.73	— .05	94 94	11/34 6/35
322	Frank Howard Inc., Pittsfield Redtop.....	L. F.	95 97.89	* .26	— 1.83	— .02	90 97	* 6/35
333	Pettee Co., Sharon Redtop.....	L. F.	99.34 93.12	.40 .12	— 6.16	— .00	90.5 92	11/34 6/35
339	Farm Service Stores, Middleboro Redtop.....	L. F.	* 90.31	* .46	— 9.06	— .17	* 90	* 6/35
508	Lawson Paint & Seed Co., Brockton Bay State Redtop.....	L. F.	97.38 97.69	.44 .38	— 1.93	— —	92 93	11/34 6/35
809	O. B. Parks, Westfield HOVEY & CO., Boston, Mass. Redtop.....	L. F.	98.45 98.46	.08 .16	— 1.33	.02 .05	92 90	2/35 6/35
150	Hovey & Co., Boston STANFORD SEED CO., Buffalo, N. Y. Redtop, No. 4117.....	L. F.	92.39 90.68	.11 .23	— 6.56	— 2.53	90 80(R)	1/35 6/35
198	Charles E. Terry, West Springfield Redtop, No. 4173.....	L. F.	95.98 93.66	.35 .54	— 5.08	— .72	88 87	1/35 7/35
557	A. E. Sherman, Lanesboro Redtop, No. 6707.....	L. F.	93.52 92.09	.73 .39	— 7.45	— .07	93 87(R)	1/34 7/35
10	Clark Hardware Co., Greenfield N. WERTHEIMER & SONS, Ligonier, Ind. Redtop Matrix, No. 34120.....	L. F.	95.89 95.11	.18 .39	3.84 4.45	.09 .05	83 82	10/34 5/35
57	Ware Grain & Coal Co., Ware Redtop, No. 34821.....	L. F.	95.06 95.17	.26 .29	4.50 4.45	.18 .09	87 82	10/34 6/35
500	W. N. Potter Grain Stores, Northampton Redtop Matrix, No. 34820.....	L. F.	95.89 95.68	.18 .78	3.84 3.46	.09 .08	83 78(R)	10/34 6/35
525	Smith Feed Co., Westfield Redtop Matrix, No. 34820.....	L. F.	95.89 94.94	.18 .18	3.84 4.82	.09 .06	83 80	10/34 6/35
14	Cutler Grain & Coal Co., Palmer WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Redtop, Richard.....	L. F.	93.57 94.89	.72 .61	— 4.45	— .35	90 85	* 5/35
	Foster Farrar, Northampton							

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
<b>REDTOP—Continued</b>							
68	Redtop, Hutchinson Hardware Co., Lynn	* 93.33 L.	* .41	— 5.65	— .61	* 93	* 6/35
87	Redtop, John Shea Co., North Andover	* 95.43 F.	* .89	— 3.62	— .06	* 83	* 6/35
132	Redtop, Pan American, J. Russell & Co. Inc., Holyoke	92 92.75 F.	1.08 .79	— 5.41	— 1.05	90 92	1/35 6/35
137	Redtop, The Wells Hardware Co., Holyoke	95 94.27 L.	.57 .72	— 3.66	— 1.35	90 72(R)	3/34 6/35
159	Redtop, No. 2784, Carlisle Hardware Co., Springfield	93 95.34 F.	1.40 1.15	— 3.47	— .04	88 85	1/35 6/35
248	Fancy Redtop, Cobb, Bates & Yerxa, Taunton	* 92.10 F.	* .80	— 6.20	— .90	91-93 85(R)	* 5/35
335	Redtop, Pan American, Pebeco Hardware Sales Co., Wellesley	93.33 92.55 L. F.	.70 .56	— 6.47	— .42	90 86	1/34 6/35
234	F. H. WOODRUFF & SONS, Milford, Conn. Redtop, Peirson Hardware Co., Pittsfield	* 96.82 F.	* .17	— 2.95	— .06	* 88	* 3/35 6/35
<b>ROUGH STALKED MEADOW GRASS</b>							
808	HOVEY & CO., Boston, Mass. Rough Stalked Meadow Grass, Hovey & Co., Boston	88.85 89.15 L. F.	.85 .72	— 10.11	— .02	85 64(R)	8/34 7/35
212	ROSS BROS. CO., Worcester, Mass. Rough Stalked Meadow Grass, Ross Bros. Co., Worcester	90 90.79 L. F.	.85 .77	— 8.39	— .05	85 61	7/34 7/35
<b>RYE</b>							
192	ALBERT DICKINSON CO., Chicago, Ill. Spring Rye, No. 7418, Frank Howard Inc., Pittsfield	97.65 97.27 L. F.	.28 .29	— 1.76	— .68	90 90	3/35 6/35

613 THOMAS W. EMERSON CO., Boston, Mass.  
Rye (6).....L.  
Thomas W. Emerson Co., Boston.....F.

8 N. WERTHEIMER & SONS, Ligonier, Ind.  
Rye; Mich. Rosen K.....L.  
Ware Grain & Coal Co., Ware.....F.

## RYEGRASS

108 JOSEPH BRECK & SONS CORP., Boston, Mass.  
Perennial Ryegrass.....L.  
Joseph Breck & Sons, Boston.....F.

222 THOMAS W. EMERSON CO., Boston, Mass.  
Perennial Ryegrass.....L.  
Elwood Adams Inc., Worcester.....F.

226 Domestic Ryegrass.....L.  
Frank Howard Inc., Pittsfield.....F.

604 Domestic Ryegrass.....L.  
Thomas W. Emerson Co., Boston.....F.

802 HOVEY & CO., Boston, Mass.  
Italian Ryegrass.....L.  
Hovey & Co., Boston.....F.

204 ROSS BROS. CO., Worcester, Mass.  
Domestic Ryegrass.....L.  
Ross Bros. Co., Worcester.....F.

810 WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.  
Perennial Ryegrass.....L.  
Thomas J. Grey Co., Boston.....F.

## TIMOTHY

241 ALLIED SEED CO., Philadelphia, Pa.  
Timothy No. B 475.....L.  
Clark Hardware Co., Greenfield.....F.

90 JOSEPH BRECK & SONS CORP., Boston, Mass.  
Timothy.....L.  
C. Skelton & Sons, Newton Centre.....F.

344 Timothy.....L.  
William Westland Co., Quincy.....F.

613	THOMAS W. EMERSON CO., Boston, Mass. Rye (6).....L. Thomas W. Emerson Co., Boston.....F.	99 96.70	* .04	— 2.34	— .92	96 82(R)	* 6/35
8	N. WERTHEIMER & SONS, Ligonier, Ind. Rye; Mich. Rosen K.....L. Ware Grain & Coal Co., Ware.....F.	97 96.96	* .01	— 1.58	— 1.45	86 85	3/35 5/35
108	JOSEPH BRECK & SONS CORP., Boston, Mass. Perennial Ryegrass.....L. Joseph Breck & Sons, Boston.....F.	* 98.45	* .54	— .24	— .77	* 90	1/35 6/35
222	THOMAS W. EMERSON CO., Boston, Mass. Perennial Ryegrass.....L. Elwood Adams Inc., Worcester.....F.	98 97.42	.10 .13	— .22	— 2.23	85 77(R)	11/34 5/35
226	Domestic Ryegrass.....L. Frank Howard Inc., Pittsfield.....F.	99.68 99.86	.11 .06	— .08	— .00	88 85	1/34 5/35
604	Domestic Ryegrass.....L. Thomas W. Emerson Co., Boston.....F.	99 99.55	.11 .12	— .14	— .19	88 90	* 6/35
802	HOVEY & CO., Boston, Mass. Italian Ryegrass.....L. Hovey & Co., Boston.....F.	98.05 98.23	1.27 1.03	.58 .56	.10 .18	85 82	3/35 6/35
204	ROSS BROS. CO., Worcester, Mass. Domestic Ryegrass.....L. Ross Bros. Co., Worcester.....F.	99 99.06	.70 .60	— .34	— —	94 89	7/34 6/35
810	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Perennial Ryegrass.....L. Thomas J. Grey Co., Boston.....F.	99.47 99.39	.25 .25	— .07	— .29	88 89	1/35 6/35
241	ALLIED SEED CO., Philadelphia, Pa. Timothy No. B 475.....L. Clark Hardware Co., Greenfield.....F.	99.60 99.69	.06 .07	— .20	— .04	92 90(R)	2/34 7/35
90	JOSEPH BRECK & SONS CORP., Boston, Mass. Timothy.....L. C. Skelton & Sons, Newton Centre.....F.	* 97.50	* .03	— 1.88	— .59	* 73(R)	* 3/35 7/35
344	Timothy.....L. William Westland Co., Quincy.....F.	99.49	.02	— .33	— .16	* 83(R)	* 7/35

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
TIMOTHY—Concluded							
175	ALBERT DICKINSON CO., Chicago, Ill. Timothy, No. 66.598. H. C. Puffer, Springfield	99.60 99.62	.05 .05	— .19	— .14	92 88(R)	1/34 7/35
650	Timothy. Pentiss Brooks & Co., Holyoke	99.60 99.69	.05 .03	— .08	— .20	92 87	1/34 6/35
71	THOMAS W. EMERSON CO., Boston, Mass. Timothy (2). Hutchinson Hardware Co., Lynn	98 98.34	* .19	— .75	— .72	92 80	*/33 6/35
220	Timothy, Gem. Elwood Adams Inc., Worcester	99.04 99.33	.09 .04	— .48	— .15	83 80(R)	11/34 7/35
301	Timothy, Gem. Cobb & Stone, Weymouth	99.60 99.65	.05 .03	— .27	— .05	94 89(R)	*/34 5/35
321	Timothy, Gem. Pettee Co., Sharon	98 99.45	* .05	— .25	— .25	92 88	5/35
400	Timothy. Lawson Paint & Seed Co., Brockton	* 99.55	* .07	— .29	— .09	* 85	5/35
513	Timothy, Bay State. O. B. Parks Co., Westfield	99.74 99.75	.05 .05	— .15	— .05	85 86	11/34 7/35
141	STANFORD SEED CO., Buffalo, N. Y. Timothy, No. 5163. George Methe Co., Springfield	99.65 99.44	.04 .04	— .14	— .38	93.75 95	1/35 7/35
148	Timothy, No. 5117. Charles E. Terry, West Springfield	99.70 99.83	.05 .02	— .11	— .04	93 90(R)	3/34 7/35
7	N. WERTHEIMER & SONS, Ligonier, Ind. Timothy, Matrix, No. 34507. Ware Grain & Coal Co., Ware	99.65 99.32	.10 .08	.20 .52	.05 .08	90 80(R)	1/35 5/35
61	Timothy, No. 84509. W. N. Potter Grain Store, Northampton	99.25 98.91	.15 .29	.30 .27	.30 .53	90 85	1/35 6/35

502	Timothy Matrix. Smith Feed Co., Westfield	L. F.	98.75 98.46	.15 .19	.35 .48	.75 .87	91 91	12/31 6/35
524	Timothy, No. 34507. Cutler Grain & Coal Co., Palmer	L. F.	99.65 99.26	.10 .10	.20 .56	— .08	90 84(R)	1/35 7/35
86	WHITNEY- ECKSTEIN SEED CO., Buffalo, N. Y. Timothy. John Shea Co., North Andover	L. F.	* 99.70	* .02	— .20	— .08	* 88	* 7/35
131	Timothy. J. Russell & Co., Holyoke	L. F.	* 98.83	* .32	— .42	— .43	* 92	*34 5/35
162	Timothy, Pan American. Carlisle Hardware Co., Springfield	L. F.	99.50 98.74	.12 .20	— .50	— .56	88 90	1/35 6/35
181	Timothy, Imperator (2). North Adams Flour & Grain Co., North Adams	L. F.	99.11 99.40	.04 .05	— .52	— .03	91 85	6/33 6/35
250	Timothy, Fancy High Grade. Cobb, Bates & Yerxa, Taunton	L. F.	* 99.45	* .07	— .25	— .23	* 94	* 4/35
370	Timothy. Farm Service Stores, Middleboro	L. F.	99.60 99.64	.05 .02	— .29	— .05	90 93	2/34 5/35
535	Timothy, Herald. Berkshire Coal & Grain Co., North Adams	L. F.	98 97.98	.93 1.08	— .81	— .13	90 70(R)	1/35 6/35

## MIXTURES

616	FERRY-MORSE SEED CO., Detroit, Mich. Green Circle Grass Mixture Medford Supply Co., Medford Domestic Ryegrass. Redtop. Domestic Ryegrass. Redtop.	L. L. L. F. F. F.	* * 65.60 19.40	1.25 1.00	23.00 12.90	— 1.10	* *) 93) 70)	* 8/35
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## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES					
428	ATLANTIC SEED CO., New York, N. Y. Grass Mixture..... L. Redtop, Kentucky Bluegrass, Domestic Ryegrass, Timothy, White Clover 1% Salem Hardware Co., Salem..... F. Domestic Ryegrass..... 36.67 Timothy..... 21.65 Redtop..... 13.38 Kentucky Bluegrass..... 5.15 White Clover..... 1.35	— 78.20	1.00 1.02	22.00 19.73	— 1.05
429	Universal Mixture..... L. Redtop, Kentucky Bluegrass, Domestic Ryegrass, New Zealand Fescue (6) Salem Hardware Co., Salem..... F. Domestic Ryegrass..... 40.78 Redtop..... 24.20 Kentucky Bluegrass..... 12.09 Chewing's Fescue..... 7.32	— 84.39	1.00 .73	18.00 13.86	— 1.02
623	Wonder Lawn Grass Mixture..... L. Redtop, Domestic Ryegrass, New Zealand Fescue (6), Kentucky Bluegrass Harvard Square Hardware Co., Cambridge..... F. Domestic Ryegrass..... 40.72 Redtop..... 27.22 Kentucky Bluegrass..... 9.32 Chewing's Fescue..... 6.18	— 83.44	1.00 1.05	18 14.56	— .95
306	JOSEPH BRECK & SONS CORP., Boston, Mass. Lawn Grass Mixture, Setab..... L. Redtop, Timothy, White Clover, Kentucky Bluegrass Cobb & Stone, Weymouth..... F. Redtop..... 67.07 Timothy..... 16.28 White Clover..... 4.83 Kentucky Bluegrass..... 4.43	92 92.61	.70 .79	7.30 6.56	— .04
342	Good Trade Grass Mixture..... L. Redtop, White Clover, Timothy, Domestic Ryegrass William Westland Co., Quincy..... F. Domestic Ryegrass..... 46.10 Timothy..... 32.09 Redtop..... 8.09 White Clover..... 3.72	— 90	.78 .38	3.34 9.05	— .57

371	Grass Mixture. Redtop, Kentucky Bluegrass, Rough Stalked Meadow Grass, Fine Leaf Fescue (4) George E. Welch Co., Scituate. Rough Stalked Meadow Grass. Redtop. Chewing's Fescue (3). Kentucky Bluegrass.	L. F. 32.60 36.66 5.47 8.65	— 83.38	.80 .74	15.00 15.15	— .73
373	Boston Park Grass Mixture. Kentucky Bluegrass, Bent Grass (6), Meadow Fescue, Redtop, Perennial Ryegrass, White Clover 1.65% The Welch Co., Scituate. Kentucky Bluegrass. Agrostis spp. Redtop and Colonial Bent Grass. Meadow Fescue. Perennial Ryegrass. White Clover.	L. F. 46.20 39.40 4.00 3.90 1.40	95.02 94.90	.47 .35	4.46 4.70	— .05
53	COMSTOCK, FERRE & CO., Wethersfield, Conn. Lawn Grass, F. F. No. 4, Lot No. 3002. Redtop, Ky. Bluegrass, Red Fescue, Domestic Ryegrass Foster Farrar, Northampton. Agrostis spp. Redtop and Colonial Bent Grass (3). Kentucky Bluegrass. Domestic Ryegrass. Red Fescue.	L. F. 36.67 27.41 17.29 6.58	— 87.95	.47 .32	8.54 8.66	— 3.07
1	THOMAS W. EMERSON CO., Boston, Mass. Special Grass Mixture. Redtop, Kentucky Bluegrass, Chewing's Red Fescue, White Clover, Astoria Bent Grass F. Diehl & Sons, Wellesley. Agrostis spp. Redtop and Colonial Bent Grass. Kentucky Bluegrass. Chewing's Fescue. White Clover.	L. F. 62.17 17.08 8.28 6.30	— 93.83	.50 .24	4.3 5.84	— .09
13	Gem Grass Mixture. Chewing's Red Fescue, Redtop, Kentucky Bluegrass, Timothy (5), German Bent Grass (4), White Clover J. F. Robinson & Co., Ware. Agrostis spp. (Redtop and Colonial Bent (3)). Kentucky Bluegrass. Chewing's Fescue. White Clover. Timothy.	L. F. 56.35 19.94 8.83 5.76 .74	— 91.62	.40 .60	8.5 7.74	— .04



## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued						
43	Shady Grass Mixture.....	L.	—	.50	5.63	—
	Redtop, Kentucky Bluegrass, Chewing's Red Fescue, White Clover, Astoria Bent Grass					
	F. Diehl & Sons, Wellesley.....	F.	92.83	.34	3.46	3.37
	Agrostis spp. (Redtop and Colonial Bent).....					
	Rough Stalked Meadow Grass (3).....					
	Kentucky Bluegrass.....					
	Chewing's Fescue.....					
63	White Clover.....					
	Early Green Lawn Seed.....	L.	—	1.00	8.00	—
	Redtop, Kentucky Bluegrass, White Clover (5), Ryegrass (6), Timothy					
	W. N. Potter Grain Store, Northampton.....	F.	96.41	.32	3.19	.08
	Timothy.....					
	Domestic Ryegrass.....					
	Redtop.....					
82	Kentucky Bluegrass.....					
	White Clover.....					
	Grass Mixture.....	L.	—	.50	4.3	—
	Redtop, Kentucky Bluegrass, Chewing's Red Fescue, White Clover, German Bent Grass (4)					
	Lynn Bird & Seed Co., Lynn.....	F.	93.26	.29	6.40	.05
	Agrostis spp. (Redtop and Colonial Bent) (3).....					
	Kentucky Bluegrass.....					
223	Chewing's Red Fescue.....					
	White Clover.....					
	Adams Special Grass Mixture.....	L.	—	1.00	8.00	—
	Chewing's Fescue—10%, Kentucky Bluegrass—35%, Fancy Redtop—35%, Perennial Ryegrass—15%, Colonial Bentgrass—5%					
	Elwood Adams Inc., Worcester.....	F.	92.15	.67	7.00	.09
	Agrostis spp. (Redtop and Colonial Bent).....					
	Kentucky Bluegrass.....					
307	Ryegrass, Perennial.....					
	Chewing's Fescue.....					
	Grass Mixture.....	L.	—	1.00	8.00	—
	Redtop, Kentucky Bluegrass, White Clover, Ryegrass (6), Timothy					
	Cobb & Stone, Weymouth.....	F.	93.09	.45	3.89	2.57
	Redtop.....					
	Domestic Ryegrass.....					
Kentucky Bluegrass.....						
Timothy.....						
White Clover.....						

320	Grass Mixture. Redtop, Kentucky Bluegrass, Chewings' Red Fescue, White Clover, Astoria Bent Grass Pettee Co., Sharon.....	L. F.	— 94.68	.50 .54	4.00 4.73	— .05
	Agrostis spp. (Redtop and Colonial Bent). Kentucky Bluegrass..... Chewings' Fescue..... White Clover.....	62.82 19.53 6.90 5.43				
394	Grass Mixture, Gem Lawn Seed. Chewings' Red Fescue (4), Redtop, Kentucky Bluegrass (5), Timothy, Astoria Bent Grass (4), White Clover (5) Farm Service Stores, Middleboro.....	L. F.	— 80.31	.4 .91	8.5 18.68	— .10
	Timothy..... Redtop..... Canada Bluegrass (3)..... Domestic Ryegrass..... White Clover..... Kentucky Bluegrass.....	26.66 21.43 13.03 15.65 2.83 .71				
402	Puttengreen Grass*..... Lawson Paint & Seed Co., Brockton..... Agrostis spp. (Redtop and Colonial Bent). Kentucky Bluegrass..... Chewings' Fescue.....	L. F.	— 96.71	* .22	* 3.05	— .02
	Agrostis spp. (Redtop and Colonial Bent). Kentucky Bluegrass..... Chewings' Fescue.....	63.36 25.86 7.49				
403	Special Grass Mixture. Redtop, Kentucky Bluegrass, Chewings Fescue, White Clover, Astoria Bent Lawson Paint & Seed Co., Brockton.....	L. F.	— 94.90	.50 .40	4.3 4.6	— .10
	Agrostis spp. (Redtop and Colonial Bent). Kentucky Bluegrass..... Chewings Fescue..... White Clover.....	65 14.90 9.60 5.40				
624	FERRY-MORSE SEED CO., Detroit, Mich. Fine Mixed Grass..... Kentucky Bluegrass—22.79%, Canada Bluegrass—7.20%, Redtop—25.78% Ryegrass (6)—16.29%, White Dutch Clover—6.26% C. G. McMullin, Newton Highlands.....	L. F.	— 78.40	.54 .75	20.92 20.30	.22 .55
	Kentucky Bluegrass..... Redtop..... Domestic Ryegrass..... Canada Bluegrass..... White Clover.....	28.08 25.90 14.90 5.02 4.50				

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture					Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued									
401	GARFIELD, WILLIAMSON INC., New York, N. Y.					—	*	*	—
	Central Park Mixture*					78.96	.95	17.33	2.76
	Lawson Paint & Seed Co., Brockton.....								
	Redtop.....								
	Domestic Ryegrass.....								
	Red Fescue.....								
	Kentucky Bluegrass.....								
55	White Clover.....								
	CHARLES C. HART SEED CO., Wethersfield, Conn.					82.8	.08	16.4	—
	Shady Lawn Mixture.....								
	Redtop, Chewings Fescue, Poa Trivialis, Timothy, Domestic Ryegrass								
	Federal Supply Co., Northampton.....					81.62	.80	15.38	2.20
	Redtop.....								
	Domestic Ryegrass.....								
	Timothy.....								
	Chewings Fescue.....								
	R. S. Meadow Grass (Poa Trivialis).....								
229	FRANK HOWARD INC., Pittsfield, Mass.					—	.09	2.78	—
	Special Grass Mixture.....								
	Kentucky Bluegrass, Fancy Redtop, Canada Bluegrass, Chewings Fescue,								
	Domestic Ryegrass, White Clover-1.21%					97.14	.20	2.40	.26
	Frank Howard Inc., Pittsfield.....								
	Domestic Ryegrass.....								
	Kentucky Bluegrass.....								
	Chewings Fescue.....								
	Redtop.....								
	Canada Bluegrass.....								
230	White Clover.....								
	Shady Lawn Mixture.....					—	.35	3.50	—
	Fancy Redtop, Kentucky Bluegrass-3%, Rough Stalked Meadow Grass,								
	Chewings Fescue, Domestic Ryegrass, Canada Bluegrass					96.47	.24	3.15	.14
	Frank Howard, Pittsfield.....								
	Rough Stalked Meadow Grass.....								
	Domestic Ryegrass.....								
	Chewings Fescue.....								
	Redtop.....								
	Canada Bluegrass.....								
Kentucky Bluegrass.....									

601	J. OLIVER JOHNSON, Chicago, Ill. Lawn Grass Seed Mixture (Winner N. S.)..... L. Fancy Redtop-12.50%, Domestic Ryegrass-49%, Fancy Kentucky Bluegrass-8%..... F. Fabian Supply Co., North Cambridge. Redtop..... 14.39 Domestic Ryegrass..... 31.29 Kentucky Bluegrass..... 6.55 Timothy (3)..... 23.81	—	1.50	29	—
		76.04	2	20.44	1.52
280	NORTHROP, KING & CO., Minneapolis, Minn. Lawn Grass Seed Mixture..... L. Domestic Ryegrass, Timothy, Redtop, Kentucky Bluegrass..... F. F. W. Woolworth, Dedham..... Domestic Ryegrass..... 25.89 Timothy..... 17.35 Redtop..... 15.06 Kentucky Bluegrass..... 13.16	—	1	27.8	—
		71.46	.55	26.16	1.83
42	OLDS & WHIPPLE INC., Hartford, Conn. Superfine Grass Mixture..... L. Recleaned Redtop, Bent Grass (6), Kentucky Bluegrass, Chewings Fescue..... F. F. Diehl & Sons, Wellesley..... Agrostis spp. (Redtop and Colonial Bent (3))..... 60.40 Kentucky Bluegrass..... 17.20 White Clover (3)..... 5.20 Chewings Fescue..... 4.60 Timothy (3)..... 4.50	95.50	.50	4	—
		91.90	.40	7.50	.20
44	Shady Dell Grass Mixture..... L. Recleaned Redtop, Poa Trivialis, Kentucky Bluegrass, Domestic Ryegrass..... F. F. Diehl & Sons, Wellesley..... Redtop..... 38.40 Rough Stalked Meadow Grass..... 26.60 Domestic Ryegrass..... 17.40 Kentucky Bluegrass..... 7.70 Timothy (3)..... 4.75	92	.50	7	—
		94.85	.65	4.40	.10
242	Quick Lawn Grass Mixture..... L. Kentucky Bluegrass, Recleaned Redtop, Domestic Ryegrass, Timothy, White Clover 2%..... F. Carr Hardware Co., Pittsfield..... Redtop..... 46.12 Domestic Ryegrass..... 31.67 Timothy..... 11.20 Kentucky Bluegrass..... 5.26 White Clover..... 2.37	96	.50	3	—
		96.62	.16	3.22	—

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture					Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued									
327	Superfine Grass Mixture.....				L.	95.50	.50	4	—
	Recleaned Redtop, White Clover, Kentucky Bluegrass, Bent Grass (6), Chewings Fescue Walsh & Packard, Hingham.....				F.	92.84	.33	6.40	.43
	Agrostis spp. (Redtop and Colonial Bent) (3).....					70.11			
	Kentucky Bluegrass.....					14.71			
	White Clover.....					4.12			
581	Chewings' Fescue.....					3.90			
	Quick Lawn Grass Mixture.....				L.	96.50	.50	3	—
	Kentucky Bluegrass, Timothy, Domestic Ryegrass, Recleaned Redtop, White Clover 2% D. J. Mahoney Hardware Co., Haverhill.....				F.	95.61	.47	3.88	.04
	Redtop.....					38.22			
	Domestic Ryegrass.....					26.99			
582	Timothy.....					23.30			
	Kentucky Bluegrass.....					5.02			
	White Clover.....					2.08			
	O. & W. Special Seed Mixture.....				L.	95.50	.50	4	—
	Recleaned Redtop, Kentucky Bluegrass, Domestic Ryegrass, White Clover, Timothy, Chewings' Fescue.....				F.	95.32	.29	4.23	.16
281	D. J. Mahoney Hardware Co., Haverhill.....								
	Redtop.....					47.26			
	Domestic Ryegrass.....					14.87			
	Timothy.....					12.82			
	Kentucky Bluegrass.....					12.37			
SEARS, ROEBUCK & CO., Chicago, Ill.	Chewings Fescue.....					4.17			
	White Clover.....					3.83			
	Green Karpet Grass Mixture.....				L.	—	1	11.98	.50
	Kentucky Bluegrass—8%, Redtop—39%, Ryegrass (6)—38% Sears, Roebuck & Co., Norwood, Mass.....				F.	80.11	.54	19.20	.15
	Domestic Ryegrass.....								
281	Redtop.....					39.67			
	Kentucky Bluegrass.....					33.46			
281	White Clover.....					6.98			

12	N. WERTHEIMER & SONS, Ligonier, Ind. Lawn Grass Mixture, No. 1.....L. Bluegrass-45%, (6) Redtop-45%, White Clover-5% Ware Grain & Coal Co., Ware.....F. Redtop.....44.95 Kentucky Bluegrass.....35.20 White Clover.....9.70	—	.34	8	—
66	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Excelsior Grass Mixture.....L. Redtop, Kentucky Bluegrass, Canada Bluegrass (4), Timothy (4), White Clover, Chewings Fescue Hutchinson Hardware Co., Lynn.....F. Redtop.....47.73 Kentucky Bluegrass.....30.27 White Clover.....7.87 Chewings Fescue.....6.87	—	.70	10	2.30
72	Sylvan Shady Spot Grass Mixture.....L. Fancy Redtop, Kentucky Bluegrass, Canada Bluegrass, Domestic Ryegrass, Timothy, Rough Stalked Meadow Grass, Crested Dogtail (5), Creeping Bent-Grass, N. Z. Chewings Fescue George H. Holden Co., Inc., Swampscott.....F. Agrostis spp. (Redtop and Creeping Bent).....24.89 Rough Stalked Meadow Grass.....19.60 Kentucky Bluegrass.....10.10 Domestic Ryegrass.....9.40 Timothy.....9.20 Chewings Fescue.....5.90 Canada Bluegrass.....6.40 Crested Dogtail.....1.80	—	.80	10	2.20
73	Greenvue Grass Mixture.....L. Canada Bluegrass, Redtop, Domestic Ryegrass, Timothy, White Clover (4) 1% George H. Holden Co., Inc., Swampscott.....F. Domestic Ryegrass.....44.12 Timothy.....11.30 Canada Bluegrass.....9.38 Redtop.....8.62	—	1.5	15	2.5
85	Excelsior Grass Mixture.....L. Kentucky Bluegrass, Redtop, White Clover, Chewings Fescue John Shea Co., North Andover.....F. Redtop.....46.35 Kentucky Bluegrass.....27.79 White Clover.....7.38 Chewings Red Fescue.....7.08	—	.70	10	2.30
		88 00	.73	10.41	.26
		74.34	1.63	17.21	6.82
		87.20	1.00	11.70	.10
		92.74	.66	6.46	.14
		89.85	.40	9.70	.05

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture					Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES—Continued									
93	Special Grass Mixture: Fancy Kentucky Bluegrass, New Zealand Chewings Fescue, Fancy Redtop, White Clover Carlisle Hardware Co., Springfield.....	L. F.	— 84.12	.70 1.04	10 13.71	2.30 1.13			
	Redtop.....								
	Kentucky Bluegrass.....								
	Chewings Fescue.....								
	White Clover.....								
289	Greenvue Special Mixture: Canada Bluegrass, Timothy, Redtop, Domestic Ryegrass, White Clover 1% Central Hardware Co., Norwood.....	L. F.	— 82.57	1.50 1.08	15 16.16	2.50 .19			
	Domestic Ryegrass.....								
	Redtop.....								
	Canada Bluegrass.....								
	Timothy.....								
	White Clover.....								
290	City Park Special Grass Mixture: Canada Bluegrass, Timothy, Redtop, Domestic Ryegrass, White Clover 3% Central Hardware Co., Norwood.....	L. F.	— 81.51	1 .99	12.50 16.99	.50 .51			
	Domestic Ryegrass.....								
	Redtop.....								
	Canada Bluegrass.....								
	Timothy.....								
	White Clover.....								
308	Special Grass Mixture: Redtop, Canada Bluegrass, Timothy, Domestic Ryegrass Cobb & Stone, Weymouth.....	L. F.	— 79.70	2.50 .98	20 17.06	2.50 2.26			
	Domestic Ryegrass.....								
	Timothy.....								
	Redtop.....								
	Canada Bluegrass.....								
337	Wellesley Special Grass Mixture: Fancy Redtop, New Zealand Chewings Fescue, Kentucky Bluegrass, White Clover Peboco Hardware Sales Co., Wellesley.....	L. F.	— 86.10	.90 1.20	10 11.50	— 1.20			
	Redtop.....								
	Kentucky Bluegrass.....								
	Chewings Fescue.....								
	White Clover.....								

## 263 F. H. WOODRUFF &amp; SONS, Milford, Conn.

Grass Seed Mixture.....	L.	*	*	*	*
White Clover, Redtop, Bluegrass (6)					
South End Hardware & Supply Co., New Bedford.....	F.	76.30	1.50	19.10	3.10
Domestic Ryegrass (3).....					
Redtop.....	45.10				
Timothy.....	5.00				
Kentucky Bluegrass (5).....	23.00				
Rough Stalked Meadow Grass (3).....	1.20				
White Clover (5).....	.80				
	1.20				

## WHOLESALE UNKNOWN

Rapid Growth Grass Mixture*.....	L.	*	*	*	*
Federal Supply Co., Northampton.....	F.	81.20	.80	17.95	.05
Redtop.....					
Timothy.....	26.55				
Domestic Ryegrass.....	23.90				
Kentucky Bluegrass.....	23.90				
White Clover.....	5.35				
	1.50				



## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	Germination Found	1935 Month of Test
<b>BEANS</b>			
2	JOSEPH BRECK & SONS CORP., Boston, Mass. Bush: Dwarf Horticultural..... M. A. Gray, East Bridgewater	73	May
29	Dwarf Black Wax Pencil Pod..... W. Greenhalgh & Sons, Fall River	96	Apr.
36	Bush: Bountiful Green Pod..... G. E. Warren, Braintree	98	May
37	Bush: Black Wax Improved Prolific..... G. E. Warren, Braintree	95	May
45	Golden Wax..... Winer's Hardware Company, South Braintree	77 (R)	June
46	Dwarf Fordhook Bush Lima..... DeWolf & Vincent, New Bedford	88	Apr.
74	Kentucky Wonder..... Sanborn & Damon Co., Quincy	95	May
81	Italian Pole Bean..... Lynn Bird & Seed Co., Lynn	87 (R)	June
273	Dwarf Long Yellow Six Weeks..... W. Greenhalgh & Sons, Fall River	94	Apr.
291	Improved Golden Wax..... Central Hardware Company, Norwood	85 (R)	June
292	Burpee's Stringless Green Pod..... Central Hardware Company, Norwood	93	Apr.
324	Burpee's Stringless..... Winer's Hardware Company, South Braintree	90	May
422	Stringless Green Pod..... George H. Holden, Swampscott	92	May
529	Burpee's Stringless Green..... Danaher Hardware Company, Williamstown	92	May
586	French Horticultural..... D. Cashman Hardware Co., Newburyport	98	June
596	Yellow Eyed..... H. V. Lawrence, Falmouth	93	June
COMSTOCK, FERRE & COMPANY, Wethersfield, Conn.			
30	Low's Champion..... J. O. Neil Hardware Co., Fall River	85	Apr.
31	Horticultural Bush..... J. O. Neil Hardware Co., Fall River	95	Apr.
THOMAS W. EMERSON CO., Boston, Mass.			
32	Kentucky Wonder Pole..... A. F. Chase Corporation, Dedham	94	Apr.
39	Pencil Pod Black Wax..... Cobb & Stone, Weymouth	92	May
323	Golden Wax, 1934..... Pettee Company, Sharon	80	May
431	Burpee's Stringless Bush Bean..... Salem Hardware Company, Salem	90	May
515	Golden Wax..... O. B. Parks Company, Westfield	83 (R)	June
516	Kentucky Wonder Wax..... O. B. Parks Company, Westfield	82	May

Note. — (R) indicates a retest.

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
BEANS—Continued			
517	Horticultural Pole..... O. B. Parks Company, Westfield	82 (R)	July
571	Extra Early Refugee..... Orange Hardware Company, Orange	73 (R)	June
583	Burpee's Stringless Green Pod..... Staples Hardware Company, Haverhill	96	June
588	Burpee's Stringless..... Massey's, Newburyport	88 (R)	June
591	Dwarf Horticultural..... Knight Grain Company, Newburyport	93	June
595	Low's Champion..... Eastman's Hardware Store, Falmouth	86 (R)	June
FERRY-MORSE SEED COMPANY, Detroit, Mich.			
284	Ferry's Golden Wax..... Sears, Roebuck & Company, Norwood	81 (R)	May
620	Red Valentine..... Harvard Square Hardware Company, Cambridge	59	May
J. J. H. GREGORY & SONS, Marblehead, Mass.			
94	New Kidney Wax..... J. J. H. Gregory & Sons, Marblehead	90	May
97	Bountiful Green..... J. J. H. Gregory & Sons, Marblehead	97	May
CHARLES C. HART SEED COMPANY, Wethersfield, Conn.			
56	Pencil Pod Black Wax..... Federal Supply Company, Northampton	92	May
188	Kentucky Wonder Pole..... Carr Hardware Co., Pittsfield	92	May
217	Dwarf Horticultural..... Waite Hardware Company, Worcester	92	May
243	Pencil Pod Black Wax..... Carr Hardware Company, Pittsfield	90	May
260	Improved Golden Wax..... (Wholesaler's germination test—85%) Hayes, New Bedford	84	Apr.
D. LANDRETH SEED CO., Bristol, Pa.			
224	Henderson's Dwarf Lima (2)..... Elwood Adams Inc., Worcester	57	June
225	Weber Wax Bush..... Elwood Adams Inc., Worcester	92	May
LEONARD SEED CO., Chicago, Illinois			
27	Davis White Wax Early (2)..... Hand Hardware Co., New Bedford	27 (R)	Apr.
561	Burpee's Improved Stringless Kidney Wax..... (Wholesaler's germination test—90%) A. E. Stewart Estate, Athol	88	June
569	Burpee's Improved Bush Lima..... (Wholesaler's germination test—90%) A. E. Stewart Estate, Athol	76	July
603	Burpee's Stringless Dwarf Green Pod..... Mendelson's Hardware Co., Waltham	87 (R)	June
FRANK NISSI, 15 Maxwell St., Haverhill, Mass.			
578	New Italian Pole..... D. J. Mahoney Hardware Co., Haverhill	67	Sept.
OLDS & WHIPPLE, Hartford, Conn.			
77	Burpee's Bush Lima..... W. R. Hill Hardware Co., Andover	68 (R)	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
BEANS—Continued			
593	Pencil Pod..... Harvey Hardware Co., Falmouth	91	June
PAGE SEED COMPANY, Greene, N. Y.			
197	Black Wax Pencil Pod..... A. S. Sherman, Lanesboro	91 (R)	June
JEROME B. RICE SEED COMPANY, Cambridge, N. Y.			
18	Low Champion Dwarf Red Cranberry..... George E. Doane, Middleboro	93	May
19	Wardwell's Kidney Wax..... George E. Doane, Middleboro	80	May
24	Burpee's Stringless Green Pod..... Sherman Company, Plymouth	93	May
25	Golden Wax Dwarf..... Sherman Company, Plymouth	75	May
49	Wardwell's Kidney..... (Wholesaler's germination test—97%) Pierce Hardware Co., Taunton	87 (R)	Apr.
50	Low's Champion..... (Wholesaler's germination test—95%) Pierce Hardware Co., Taunton	92	Apr.
152	Dwarf Golden Wax..... The Wells Hardware Co., Holyoke	85 (R)	June
153	Round Pod Kidney Wax..... The Wells Hardware Co., Holyoke	92	May
176	Horticultural Dwarf..... Burlingame & Darbys Co., North Adams	89	May
178	Pencil Pod Black Wax..... Payne-Cummings Hardware Co., North Adams	92	May
183	Golden Wax Dwarf..... R. A. Stacey & Sons, Williamstown	82	June
186	Improved Golden Wax..... (Wholesaler's germination test—90%) Frank Howard, Inc., Pittsfield	86	May
420	Dwarf Rust Golden Wax..... George H. Holden, Swampscott	86	May
551	Horticultural Pole..... (Wholesaler's germination test—98%) S. Allen's Sons, Greenfield	91	June
555	Burpee's Stringless Golden Pod..... Clark Hardware Co., Greenfield	90	June
ROSS BROS. CO., Worcester, Mass.			
600	Burpee's Green Pod Stringless..... Hyannis Hardware Co., Hyannis	90	June
F. H. WOODRUFF & SONS, Milford, Conn.			
78	French Horticultural..... John Shea Company, North Andover	94	May
99	Wardwell's Kidney Wax..... B. F. Hill & Co., Salem	90	May
144	Improved Golden Wax..... George Methe Company, Springfield	82	May
145	Pencil Pod..... George Methe Company, Springfield	95	May
568	Improved Golden Wax..... Greenfield Farmers Cooperative Exchange, Greenfield	79 (R)	June
577	Tendergreen or New Stringless..... D. J. Mahoney Hardware Co., Haverhill	92 (R)	May

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
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## BEANS—Concluded

559	S. D. WOODRUFF & SONS, Orange, Conn. Kentucky Wonder..... W. E. Aubuchon Co. Inc., Orange	90	June
574	Horticultural Pole..... Central Hardware Co., Fitchburg	91	June

## BEETS

272	JOSEPH BRECK & SONS CORP., Boston, Mass. Dewing's Early Blood..... W. Greenhalgh & Sons, Fall River	82	May
310	Detroit Dark Red..... Winer's Hardware Company, South Braintree	78 (R)	May
314	Red Egyptian..... Wilde's Store, Holbrook	87	May
386	Red Egyptian..... I. Stein, Plymouth	67 (R)	June
587	Edwards..... D. Cashman Hardware Company, Newburyport	58 (R)	June
652	Mangel Wurzel..... Danaher Hardware Company, Williamstown	39	June
770	Early Egyptian..... H. V. Lawrence, Falmouth	67 (R)	June
797	Red Egyptian..... Medford Supply Co., Medford	59 (R)	June
326	THOMAS W. EMERSON CO., Boston, Mass. Crosby Egyptian Blood Turnip..... Pettee Co., Sharon	92	May
607	Crosby Egyptian..... Thomas W. Emerson Co., Boston	63 (R)	June
723	Detroit Dark Red..... Orange Hardware Co., Orange	67 (R)	May
763	Detroit Dark Red..... Knight Grain Co., Newburyport	74 (R)	May
253	CHARLES C. HART SEED CO., Wethersfield, Conn. Early Wonder..... (Wholesaler's germination test—85+%) Pierce Hardware Co., Taunton	87	May
377	Early Wonder..... (Wholesaler's germination test—85+%) I. F. Porter, Pembroke	82	May
667	Detroit Dark Red Turnip..... Carr Hardware Co., Pittsfield	52	May
675	Egyptian Blood..... Waite Hardware Co., Worcester	66 (R)	May
785	Early Eclipse..... Waltham Supply Co., Waltham	57 (R)	June
789	Crosby Egyptian..... F. W. Richardson, Waltham	87	June
673	D. LANDRETH SEED CO., Bristol, Pa. Detroit Dark Red..... Elwood Adams Inc., Worcester	74 (R)	May
730	LEONARD SEED CO., Chicago, Ill. Detroit Dark Red..... (Wholesaler's germination test—85%) A. E. Stewart Estate, Athol	64 (R)	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
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## BEETS—Concluded

PAGE SEED CO., Greene, N. Y.			
295	Detroit Dark Red. (Wholesaler's germination test—85%) H. A. Spear & Son, Walpole	75 (R)	May
406	Detroit Dark Red. (Wholesaler's germination test—85%) J. F. Robinson Co., Ware	69 (R)	June
JEROME B. RICE SEED CO., Cambridge, N. Y.			
184	Early Blood Turnip Improved. R. A. Stacey & Sons, Williamstown	65 (R)	June
680	Detroit Dark Red. (Wholesaler's germination test—85%) Frank Howard, Inc., Pittsfield	60 (R)	June
699	Mangel. Payne Cummings Hardware Co., North Adams	82	May
721	Crosby Egyptian. (Wholesaler's germination test—88%) S. Allen's Sons, Greenfield	85	May
793	Eclipse Blood Turnip. Andrew F. Curtin & Sons, Medford	69 (R)	June
ROSS BROS. CO., Worcester, Mass.			
333	Early Egyptian. J. William Howe Estate, Hingham	79 (R)	May
657	Early Wonder. Ross Bros. Co., Worcester	62 (R)	May
777	Crosby's Early Egyptian. Hyannis Hardware Co., Hyannis	55 (R)	June
F. H. WOODRUFF & SONS, Milford, Conn.			
686	Detroit Dark Red. Peirson Hardware Co., Pittsfield	59	May
712	Early Blood Turnip. F. I. Webster Co., Greenfield	78 (R)	June

## BROCCOLI

JOSEPH BRECK & SONS CORP., Boston, Mass.			
641	Calabrese. C. Skelton & Sons, Newton Centre	89	July
THOMAS W. EMERSON CO., Boston, Mass.			
379	Broccoli. H. T. Clark, Hanson	94	July
FERRY-MORSE SEED CO., Detroit, Mich.			
801	Italian Green Sprouting. Sinclair Hardware Co., Medford	70	July
ROSS BROS. CO., Worcester, Mass.			
656	Early Green Italian Ross Bros. Co., Worcester	95	July

## BRUSSELS SPROUTS

FERRY-MORSE SEED CO., Detroit, Mich.			
799	L. I. Improved. Sinclair Hardware Co., Medford	74 (R)	July
CHARLES C. HART SEED CO., Wethersfield, Conn.			
646	Long Island Improved. (Wholesaler's germination test—70%) J. Russell & Co., Holyoke	78	July
ROSS BROS. CO., Worcester, Mass.			
658	Long Island Improved. Ross Bros. Co., Worcester	86	July

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
CABBAGE			
247	JOSEPH BRECK & SONS CORP., Boston, Mass. Savoy..... Copeland Hardware Co., Taunton	59 (R)	July
426	Early Jersey Wakefield..... F. N. Osborn Co., Inc., Marblehead	67 (R)	July
625	Warren Stone Mason..... C. G. McMullin, Newton Highlands.	45 (R)	July
754	Danish Ball Head..... D. Cashman, Newburyport	65 (R)	July
792	Warren Stone Mason..... Andrew F. Curtin & Sons, Medford	51 (R)	July
796	Early Jersey Wakefield..... Medford Supply Co., Medford	61 (R)	July
296	THOMAS W. EMERSON CO., Boston, Mass. Large Drumhead Stone Mason..... H. A. Spear & Sons, Walpole	63 (R)	July
608	Early Jersey Wakefield..... Thomas W. Emerson Co., Boston	50 (R)	July
609	Premium Flat Dutch..... Thomas W. Emerson Co., Boston	96	July
749	Drumhead Savoy..... Staples Hardware Co., Haverhill	60 (R)	July
798	FERRY-MORSE SEED CO., Detroit, Mich. & San Francisco, Calif. Copenhagen Market..... Sinclair Hardware Co., Medford	72 (R)	July
311	FREDONIA SEED CO., Fredonia, N. Y. Danish Ball Head..... Cutliff Market, Braintree	51 (R)	July
358	CHARLES C. HART SEED CO., Wethersfield, Conn. Danish Ball Head..... (Wholesaler's germination test—65%) J. Niedbala, Hadley	70	July
676	Danish Ball Head..... Waite Hardware Co., Worcester	87	June
773	Premium Late Flat Dutch..... (Wholesaler's germination test—75+%) D. M. Seabury & Sons, Barnstable	78	July
786	Drumhead Savoy..... Waltham Supply Co., Waltham	90	July
807	HOVEY & CO., Boston, Mass. Golden Acre..... Hovey & Co., Boston	86	July
693	JEROME B. RICE SEED CO., Cambridge, N. Y. All Season..... (Wholesaler's germination test—86%) Frank Howard Inc., Pittsfield	84	July
702	Copenhagen..... Payne Cummings Hardware Co., North Adams	85 (R)	July
720	Early Jersey Wakefield..... (Wholesaler's germination test—92%) S. Allen's Sons, Greenfield	93	June
334	ROSS BROS. CO., Worcester, Mass. Copenhagen Market..... J. William Howe Estate, Hingham	88	July
816	SLUIS & GROOT. Danish Ball Head..... Thomas J. Grey Co., Boston	91	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
CABBAGE —Concluded			
713	F. H. WOODRUFF AND SONS, Milford, Conn. Copenhagen Market. F. I. Webster Co., Greenfield	92	June
735	Stone Mason. Fitchburg Hardware Co., Fitchburg	55 (R)	July
746	Danish Ball Head. D. J. Mahoney Hardware Co., Haverhill	63	June
CARROTS			
258	JOSEPH BRECK & SONS CORP., Boston Mass. Chantenay. DeWolf and Vincent, New Bedford	77	Apr.
274	Long Orange. W. Greenhalgh & Sons, Fall River	81 (R)	May
286	Chantenay. Town Square Hardware & Plumbing Supply Co., Norwood	75 (R)	May
309	Danvers Half Long. Winer's Hardware Company, South Braintree	80	May
424	Long Orange. F. N. Osborne Co., Inc., Marblehead	76	May
661	Danvers Half Long. Danaher Hardware Co., Williamstown	74 (R)	July
156	COMSTOCK, FERRE & CO., Wethersfield, Conn. Danvers Half Long. Carlisle Hardware Co., Springfield	52 (R)	June
708	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Danvers Half Long Tapering Late, No. 7B 1315. Eastern States Farmers Exchange, Springfield	71 (R)	June
294	THOMAS W. EMERSON CO., Boston, Mass. Danvers Half Long. H. A. Spear & Sons, Walpole	57 (R)	May
724	Danvers Half Long. Orange Hardware Co., Orange	68 (R)	June
748	Danvers Half Long. Staples Hardware Co., Haverhill	67 (R)	June
627	FERRY-MORSE SEED CO., Detroit, Mich. & San Francisco, Calif. Chantenay. C. G. McMullin, Newton Highlands	86	May
252	CHARLES C. HART SEED CO., Wethersfield, Conn. Danvers Half Long Stump Root. Pierce Hardware Co., Taunton	67 (R)	May
362	Danvers Half Long Stump Root. (Wholesaler's germination test—80%) Grange Store, Amherst	78 (R)	May
405	Danvers Half Long Stump Root. (Wholesaler's germination test—80%) J. Niedbala, Hadley	70	May
439	Danvers Half Long Stump Root. (Wholesaler's germination test—75%) F. W. Carson, Quincy	70	May
669	Improved Long Orange. Carr Hardware Co., Pittsfield	73 (R)	June
677	Long Orange. Waite Hardware Co., Worcester	77	May
784	Danvers. Waltham Supply Co., Waltham	67 (R)	July

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	Germination Found	1935 Month of Test
CARROTS—Concluded			
804	HOVEY & CO., Boston, Mass. Danvers Half Long..... Hovey & Co., Boston	82 (R)	July
779	LEONARD SEED CO., Chicago, Ill. Danvers..... Mendelson's Hardware Co., Waltham	80	June
341	NORTHRUP, KING & CO., Minneapolis, Minn. Chantenay..... Pebeco Hardware Sales Co., Wellesley	54 (R)	June
445	OLDS & WHIPPLE, Hartford, Conn. Danvers Half Long..... W. R. Hill Hardware Co., Andover	75	May
765	Danvers Half Long..... Harvey Hardware Co., Falmouth	80	June
413	JEROME B. RICE SEED CO., Cambridge, N. Y. Early French Short Horn or Early Scarlet Horn..... (Wholesaler's germination test—80%) L. W. Jenney, South Carver	67 (R)	May
662	New Oxheart Orange..... R. A. Stacey & Sons, Williamstown	78	June
692	Danvers Half Long..... (Wholesaler's germination test—76%) Frank Howard, Inc., Pittsfield	57 (R)	July
815	Danvers Half Long..... Thomas J. Grey Co., Boston	56 (R)	June
419	ROSS BROS. CO., Worcester, Mass. Danvers Half Long..... Lynn Hardware Co., Lynn	70 (R)	May
687	F. H. WOODRUFF & SONS, Milford, Conn. Danvers Half Long..... Peirson Hardware Co., Pittsfield	83	May
714	Danvers Half Long..... F. I. Webster Co., Greenfield	75 (R)	June
734	Long Orange..... Fitchburg Hardware Co., Fitchburg	71 (R)	June
740	Danvers Half Long..... Union Hardware Co., Fitchburg	69 (R)	June
CAULIFLOWER			
345	JOSEPH BRECK & SONS CORP., Boston, Mass. Early Snowball..... William Westland Co., Quincy	53 (R)	July
709	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Holland Erfurt Long Island Improved No. 8A 22315..... (Wholesaler's germination test—94%) Eastern States Farmers Exchange, Springfield	89	July
378	THOMAS W. EMERSON CO., Boston, Mass. Early Snowball..... H. T. Clark, Hanson	70 (R)	July
681	Early Snowball..... England Bros., Pittsfield	60 (R)	July
179	JEROME B. RICE SEED CO., Cambridge, N. Y. Henderson's Early Snowball..... Payne, Cummings Hardware Co., North Adams	75	July
654	ROSS BROS. CO., Worcester, Mass. Early Snowball, No. 9..... Ross Bros. Co., Worcester	85	July



## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
<b>CELERY</b>			
437	JOSEPH BRECK & SONS CORP., Boston, Mass. Easy Blanching..... Winer's, Quincy	91	June
629	Easy Blanching..... J. H. Chandler Hardware Co., Newton Centre	84	June
158	COMSTOCK, FERRE & CO., Wethersfield, Conn. Golden Detroit..... Carlisle Hardware Co., Springfield	55 (R)	July
710	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Easy Blanching, Jersey No. 9D 23014..... (Wholesaler's germination test—76%) Eastern States Farmers Exchange, Springfield.	35 (R)	June
351	FERRY-MORSE SEED CO., Detroit, Mich. & San Francisco, Calif. Golden Yellow Self Blanching..... B. F. Hill Co., Salem	53 (R)	May
353	Golden Yellow Self Blanching..... Murphy Hardware Co., Salem	60 (R)	May
180	JEROME B. RICE SEED CO., Cambridge, N. Y. Rice's Perfected Self Blanching White Plume..... Payne, Cummings Hardware Co., North Adams	91	June
348	Perfected Self Blanching White Plume..... John Shea Company, North Andover	93	May
655	ROSS BROS. CO., Worcester Golden Self Blanching..... Ross Bros. Co., Worcester	74	June

## SWEET CORN

4	JOSEPH BRECK & SONS CORP., Boston, Mass. Golden Giant..... M. A. Gray, East Bridgewater	86	May
5	Bantam Evergreen..... M. A. Gray, East Bridgewater	83	May
35	Golden Bantam (Mass. grown)..... G. E. Warren, Braintree	93	May
40	Golden Dawn..... The Welch Co., Scituate	91	May
41	Early Sensation..... The Welch Co., Scituate	80	May
80	Golden Sunrise..... Lynn Bird & Seed Co., Lynn	86	May
530	Country Gentlemen..... Danaher Hardware Co., Williamstown	80	May
598	Golden Bantam (Western grown)..... H. V. Lawrence, Falmouth	83	June
599	Golden Giant..... Hyannis Hardware Co., Hyannis	81	June
157	COMSTOCK, FERRE & CO., Wethersfield, Conn. Whipple's Yellow..... Carlisle Hardware Co., Springfield	90	May
567	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Golden Sunshine..... (Wholesaler's germination test—92%) Greenfield Farmers Cooperative Exchange, Greenfield	91	June
47	Country Gentlemen..... (Wholesaler's germination test—82%) Eastern States Farmers Exchange, Taunton	89	April

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
<b>SWEET CORN—Continued</b>			
521	Golden Early Market, No. 11A 12415..... (Wholesaler's soil test—96%) Eastern States Farmers Exchange, Springfield	93	May
76	THOMAS W. EMERSON CO., Boston, Mass. Bantam Evergreen..... W. R. Hill Hardware Co., Andover	87	May
520	Whipple's Yellow..... O. B. Parks Co., Westfield	73 (R)	May
570	Golden Sunrise..... Orange Hardware Co., Orange	87	June
584	Early Golden Sunrise..... Staples Hardware Co., Haverhill	92	May
594	Golden Bantam..... Eastman's Hardware Store, Falmouth	85	June
283	FERRY-MORSE SEED CO., Detroit, Mich. & San Francisco, Calif. Stowell's Evergreen..... Sears, Roebuck & Co., Norwood	78 (R)	April
100	J. J. H. GREGORY & SONS, Marblehead, Mass. Carpenter's Golden..... B. F. Hill Co., Salem	94	May
143	CHARLES C. HART SEED CO., Wethersfield, Conn. Golden Sunshine..... George Methe Co., Springfield	88	May
216	Whipple's Early Yellow..... Waite Hardware Co., Worcester	66	May
245	Black Mexican..... Carr Hardware Co., Pittsfield	93	May
602	Golden Bantam..... Fabian Supply Co., North Cambridge	84	June
26	LEONARD SEED CO., Chicago, Ill. Potter's Excelsior Medium Early (2)..... Hand Hardware Co., New Bedford	42 (R)	May
619	Golden Sunshine..... Mendelson's Hardware Co., Waltham	86	June
539	O. & M. SEED CO., Green Springs, Ohio Golden Bantam..... Berkshire Coal & Grain Co., North Adams	90	May
200	PAGE SEED CO., Greene, N. Y. Bantam Evergreen..... (Wholesaler's soil test—90%) A. E. Sherman, Lanesboro	90	May
20	JEROME B. RICE SEED CO., Cambridge, New York Whipple's Early Yellow..... George E. Doane, Middleboro	81	May
23	Crosby's Sweet Corn..... Sherman Co., Plymouth	81	May
134	Golden Bantam..... The Wells Hardware Co., Holyoke	89	May
187	Golden Bantam..... (Wholesaler's germination test—92%) Frank Howard Inc., Pittsfield	94	May
552	Golden Bantam..... (Wholesaler's germination test—94%) S. Allen's Sons, Greenfield	92	June
147	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Golden Bantam..... (Wholesaler's germination test—90%, 1/35) Charles E. Terry, West Springfield	90	May

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
<b>SWEET CORN—Concluded</b>			
83	F. H. WOODRUFF & SONS, Milford, Conn. Golden Sunshine..... John Shea Co., North Andover	84	May
554	Bantam Evergreen..... F. I. Webster Co., Greenfield	80	June
580	Early Yellow Sensation..... D. J. Mahoney Hardware Co., Haverhill	78	June
560	S. D. WOODRUFF & SONS, Orange, Conn. Golden Bantam..... W. E. Aubuchon Co., Orange	89	June
<b>CRESS</b>			
643	CHARLES C. HART SEED CO., Wethersfield, Conn. Curled or Pepper Grass..... J. Russell & Co., Holyoke	95	May
<b>CUCUMBER</b>			
651	JOSEPH BRECK & SONS CORP., Boston, Mass. Improved Long Green..... Danaher Hardware Co., Williamstown	98	May
161	COMSTOCK, FERRE & CO., Wethersfield, Conn. Improved Long Green..... Carlisle Hardware Co., Springfield	93	May
725	THOMAS W. EMERSON CO., Boston, Mass. Improved Long Green..... Orange Hardware Co., Orange	97	June
757	White Spine..... Massey's, Newburyport	88	June
761	Improved White Spine..... Knight Grain Co., Newburyport	92	June
766	Improved White Spine..... Eastman's Hardware Co., Falmouth	86	June
264	FERRY-MORSE SEED CO., Detroit, Mich. & San Francisco, Calif. Early White Spine, Pepine Catriola..... South End Hardware & Supply Co., New Bedford	71 (R)	April
302	Early White Spine..... Bellingham Hardware Co., Weymouth	86 (R)	May
628	Boston Pickling..... C. G. McMullin, Newton Highlands	77 (R)	May
632	Long Green White Spine..... J. H. Chandler Hardware Co., Newton Centre	89	May
312	FREDONIA SEED CO., Fredonia, N. Y. Early White Spine..... Cutcliff Market, Braintree	60 (R)	May
376	CHARLES C. HART SEED CO., Wethersfield, Conn. Improved White Spine..... (Wholesaler's germination test—90%) I. F. Porter, Pembroke	96	April
390	Boston Pickling..... (Wholesaler's germination test—80+%) Griffin Bros., Wareham	82	May
435	Improved Long Green..... (Wholesaler's germination test—90%) Winer's Inc., Quincy	90	May
674	Davis Perfect..... Waite Hardware Co., Worcester	94	May
803	HOVEY & CO., Boston, Mass. Davis Perfect..... Hovey & Co., Boston	96	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	Germination Found	1935 Month of Test
<b>CUCUMBER—Concluded</b>			
300	NORTHRUP, KING & CO., Minneapolis, Minn. Improved Long Green..... Samuel Kashden, Walpole	68 (R)	May
355	Improved White Spine..... Murphy Hardware Co., Salem	68 (R)	May
443	OLDS & WHIPPLE, Hartford, Conn. Arlington White Spine..... W. R. Hill Hardware Co., Andover	58 (R)	June
409	PAGE SEED CO., Greenc, N. Y. Long Green..... (Wholesaler's germination test—90%) J. F. Robinson Co., Ware	95	April
318	JEROME B. RICE SEED CO., Cambridge, N. Y. Davis Perfect..... Sawyer Hardware Co., Canton	85	April
411	Improved Long Green..... L. W. Jenney, South Carver	81 (R)	May
691	Snow's Pickling..... (Wholesaler's germination test—96%) Frank Howard Inc., Pittsfield	83 (R)	May
332	ROSS BROS. CO., Worcester, Mass. Improved Long Green..... J. William Howe Estate, Hingham	87	April
360	Early White Spine..... H. S. Packard, Cummington	81 (R)	May
738	F. H. WOODRUFF & SONS, Milford, Conn. Improved Long Green..... Union Hardware Co., Fitchburg	89 (R)	June
<b>ENDIVE</b>			
266	FREDONIA SEED CO., Fredonia, N. Y. Large Green Curled..... C. A. Gifford, Westport	60 (R)	April
299	NORTHRUP, KING & CO., Minneapolis, Minn. Curled..... Samuel Kashdan, Walpole	84	April
739	F. H. WOODRUFF & SONS, Milford, Conn. Broad Leaved Batavian..... Union Hardware Co., Fitchburg	73 (R)	June
<b>KALE</b>			
155	COMSTOCK, FERRE & CO., Wethersfield, Conn. Dwarf Green Curled..... Carlisle Hardware Co., Springfield	89	July
338	NORTHRUP, KING & CO., Minneapolis, Minn. Dwarf Green Curled..... Peboco Hardware Sales Co., Wellesley	57 (R)	July
<b>KOHL RABI</b>			
695	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. White Vienna, No. 18 A 1314..... Eastern States Farmers Exchange, Springfield	82	July
645	CHARLES C. HART SEED CO., Wethersfield, Conn. White Vienna..... J. Russell & Co., Holyoke	85 (R)	July
672	D. LANDRETH SEED CO., Bristol, Pa. White Vienna..... Elwood Adams Inc., Worcester	83	July

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
LETTUCE			
813	ASSOCIATED SEED GROWERS INC., Milford, Conn. White Boston..... Thomas J. Grey & Co., Boston	86	June
438	JOSEPH BRECK & SONS CORP., Boston, Mass. N. Y. Improved or Iceberg..... Winer's Inc., Quincy	95	May
442	Black Seeded Tennisball..... F. W. Carson, Quincy	52 (R)	May
753	Early Curled Selesia..... D. Cushman Hardware Co., Newburyport	72 (R)	June
255	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Early Curled Simpson..... (Wholesaler's germination test—86%) Eastern States Farmers Exchange, Taunton	97	May
381	THOMAS W. EMERSON Co., Boston, Mass. Tennisball Black Seeded..... H. T. Clark, Hanson	62 (R)	May
682	Prizehead..... England Bros., Pittsfield	89 (R)	June
762	Iceberg..... Knight Grain Co., Newburyport	85	June
767	Simpson Black Seeded..... Eastman's Hardware Store, Falmouth	73	June
350	FERRY-MORSE SEED CO., Detroit, Mich. Early Prize Head..... B. F. Hills, Salem	78 (R)	May
267	FREDONIA SEED CO., Fredonia, N. Y. Early Curled Silesia..... C. A. Gifford, Westport	64	May
271	Black Seeded Simpson..... C. S. Sawyer, Fall River	80 (R)	May
304	CHARLES C. HART SEED CO., Wethersfield, Conn. Simpson Early Curled..... (Wholesaler's germination test—80+%) Bellingham Hardware Co., Weymouth	97	May
375	Romaine or White Cos..... (Wholesaler's germination test—80+%) I. F. Porter, Pembroke	81	May
726	Early Prize Head..... C. F. Page Hardware Co., Athol	16 (R)	May
357	LAKE SHORE SEED CO., Dunkirk, N. Y. Early Curled Silesia..... J. Niedbala, Hadley	24	May
392	Big Boston..... Griffin Bros., Wareham	88	May
340	NORTHRUP, KING & CO., Minneapolis, Minn. New York Special or Los Angeles Market..... Peboco Hardware Sales Co., Wellesley	85	May
352	Big Boston..... Murphy Hardware Co., Salem	71 (R)	May
383	Grand Rapids..... Sherman Co., Plymouth	80 (R)	May
293	PAGE SEED CO., Greene, N. Y. Iceberg Head..... (Wholesaler's germination test—90%) H. A. Spear & Son, Walpole	88	May

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
LETTUCE—Concluded			
JEROME B. RICE SEED CO., Cambridge, N. Y.			
315	Big Boston..... Wilde's Store, Holbrook	87	May
317	Grand Rapids..... Sawyer Hardware Co., Canton	81 (R)	May
410	Early Prize Head..... L. W. Jenney, South Carver	90	May
421	Black Seeded Simpson..... George H. Holden, Swampscott	96	May
663	Black Seeded Simpson..... R. A. Stacey & Sons, Williamstown	95	May
690	Big Boston..... (Wholesaler's germination test—90%) Frank Howard Inc., Pittsfield	90	May
ROSS BROS. CO., Worcester, Mass.			
417	Simpson Early Curled..... Lynn Hardware Co., Lynn	90	May
776	Light Iceberg..... Hyannis Hardware Co., Hyannis	91	June
F. H. WOODRUFF & SONS, Milford, Conn.			
715	Big Boston..... F. I. Webster Co., Greenfield	89	May
736	Early Curled Simpson..... Fitchburg Hardware Co., Fitchburg	88	June
S. D. WOODRUFF & SONS, Orange, Conn.			
744	Big Boston..... Central Hardware Co., Fitchburg	93	June
719	Prize Head..... W. E. Aubuchon Co., Orange	84	May
MUSKMELON			
JOSEPH BRECK & SONS CORP., Boston, Mass.			
416	Rock Ford..... Hutchinson Hardware Co., Lynn	49 (R)	May
EASTERN STATES FARMERS EXCHANGE, Springfield, Mass.			
694	Honey Rock, No. 21B 25315..... Eastern States Farmers Exchange, Springfield (Wholesaler's germination test—92%)	83 (R)	June
CHARLES C. HART SEED CO., Wethersfield, Conn.			
774	Emeral Gem..... (Wholesaler's germination test—90+%) D. M. Seabury & Sons, Barnstable	83 (R)	June
JEROME B. RICE SEED CO., Cambridge, N. Y.			
412	Tip Top..... L. W. Jenney, South Carver	84	May
ONION			
JOSEPH BRECK & SONS CORP., Boston, Mass.			
794	Danvers Yellow Globe..... Andrew F. Curtin & Sons, Medford	85	June
COMSTOCK, FERRE & CO., Wethersfield, Conn.			
154	Select Danvers Yellow Globe..... Carlisle Hardware Co., Springfield	88	May
EASTERN STATES FARMERS EXCHANGE, Springfield, Mass.			
254	Ebenezer, Flat Yellow Early, No. 22T 1315..... (Wholesaler's germination test—82%) Eastern States Farmers Exchange, Taunton	83	April
696	Yellow Globe Danvers, No. 22C 16725..... Eastern States Farmers Exchange, Springfield	82	May

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
ONION—Concluded			
329	FERRY-MORSE SEED CO., Detroit, Mich. Yellow Globe Danvers. Walsh & Packard, Hingham	91	May
303	CHARLES C. HART SEED CO., Wethersfield, Conn. Yellow Globe Danvers. (Wholesaler's germination test—80%) Bellingham Hardware Co., Weymouth	65	May
448	Large Red Wethersfield. (Wholesaler's germination test—75%) Sanborn & Damon, Quincy	65 (R)	May
705	Large Red Wethersfield. (Wholesaler's germination test—75%) Burlingame & Darbys Co., North Adams	58	May
670	BUDD D. HAWKINS, Reading, Vt. Large Red Wethersfield. Elwood Adams Inc., Worcester	85	May
805	HOVEY & CO., Boston, Mass. Yellow Globe Danvers. Hovey & Co., Boston	80	June
684	NORTHROP, KING & CO., Minneapolis, Minn. Yellow Globe Danvers. Peirson Hardware Co., Pittsfield	75 (R)	June
269	W. G. PEARSE, Fall River, Mass. Red Globe. C. A. Sawyer, Fall River	93	April
177	JEROME B. RICE SEED CO., Cambridge, N. Y. Prizetaker. Payne Cummings Hardware Co., North Adams	60 (R)	June
664	Yellow Globe Danvers. R. A. Stacey & Sons, Williamstown	77	May
689	Yellow Globe Danvers. (Wholesaler's germination test—90%) Frank Howard Inc., Pittsfield	85	May
638	ROSS BROS. CO., Worcester, Mass. Yellow Globe Danvers. (Wholesaler's germination test—82%) Ross Bros. Co., Worcester	85	May
PARSLEY			
697	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Peerless Moss Curled, No. 23B 1315. Eastern States Farmers Exchange, Springfield	90	July
380	THOMAS W. EMERSON CO., Boston, Mass. Double Curled. H. T. Clark, Hanson	75	May
630	FERRY-MORSE SEED CO., Detroit, Mich. Champion Moss Curled. J. H. Chandler Hardware Co., Newton Centre	78	May
703	CHARLES C. HART SEED CO., Wethersfield, Conn. Moss Curled. (Wholesaler's germination test—60%) Burlingame Darbys Co., North Adams	65	July
261	LAKE SHORE SEED CO., Dunkirk, N. Y. Double Curled Arricciata Doppio. Henry Perry, Rivet St., New Bedford	24	May
382	NORTHROP, KING & CO., Minneapolis, Minn. Moss Curled. Sherman Co., Plymouth	73	May

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	Germination Found	1935 Month of Test
PARSLEY—Concluded			
408	PAGE SEED CO., Greene, N. Y. Moss Curled..... (Wholesaler's germination test—85%) J. F. Robinson Co., Ware	67 (R)	May
659	ROSS BROS. CO., Worcester, Mass. Moss Curled..... Ross Bros. Co., Worcester	75 (R)	July
PARSNIP			
625	JOSEPH BRECK & SONS CORP., Boston, Mass. Hollow Crown..... C. G. McMullin, Newton Highlands	62	May
276	COMSTOCK, FERRE & CO., Wethersfield, Conn. Hollow Crown..... J. O. Neil Hardware Co., Fall River	77	May
432	THOMAS W. EMERSON CO., Boston, Mass. Hollow Crown..... Salem Hardware Co., Salem	78	May
325	FERRY-MORSE SEED CO., Detroit, Mich. Hollow Crown or Guernsey..... Bellingham Hardware Co., Weymouth	79	May
354	Hollow Crown..... Murphy Hardware Co., Salem	67	May
356	CHARLES C. HART SEED CO., Wethersfield, Conn. Hollow Crown..... (Wholesaler's germination test—80%) J. Niedbala, Hadley	74	May
363	Hollow Crown..... (Wholesaler's germination test—80%) Grange Store, Amherst	76	May
374	Hollow Crown..... I. F. Porter, Pembroke	80	May
436	Hollow Crown..... (Wholesaler's germination test—80%) Winer's Inc., Quincy	86	May
449	Hollow Crown..... (Wholesaler's germination test—80%) Sanborn & Damon, Quincy	85	May
706	Hollow Crown..... (Wholesaler's germination test—80%) Burlingame Darbys Co., North Adams	83	June
671	BUDD D. HAWKINS, Reading, Vt. Improved Hollow Crown..... Elwood Adams Inc., Worcester	76	May
685	NORTHRUP, KING & CO., Minneapolis, Minn. Improved Hollow Crown or Guernsey..... Peirson Hardware Co., Pittsfield	62 (R)	June
407	PAGE SEED CO., Greene, N. Y. Hollow Crown..... (Wholesaler's germination test—80%) J. F. Robinson Co., Ware	78	May
688	JEROME B. RICE SEED CO., Cambridge, N. Y. Student..... (Wholesaler's germination test—75%) Frank Howard Inc., Pittsfield	79	June
701	Hollow Crown..... Payne Cummings Hardware Co., North Adams	75	June
418	ROSS BROS. CO., Worcester, Mass. Hollow Crown..... Lynn Hardware Co., Lynn	78	May
742	S. D. WOODRUFF & SONS, Orange, Conn. Guernsey or Sweet Marrow..... Central Hardware Co., Fitchburg	75	June



## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
PEAS			
3	JOSEPH BRECK & SONS CORP., Boston, Mass. Notts Excelsior..... M. A. Gray, East Bridgewater	88	May
34	Laxtonia..... G. E. Warren, Braintree	91	May
38	Hundredfold..... Cobb & Stone, Weymouth	93	May
75	Thomas Laxton..... Sanborn & Damon Co., Quincy	84 (R)	July
79	Carter Telephone..... Lynn Bird & Seed Co., Lynn	78 (R)	May
528	Alaska..... Danaher Hardware Co., Williamstown	93	June
585	Sutton's Excelsior..... D. Cashman Hardware Company, Newburyport	82	June
33	THOMAS W. EMERSON CO., Boston, Mass. Thomas Laxton..... A. T. Chase Corp., Dedham	83	April
518	Telephone..... O. B. Parks Co., Westfield	74	May
519	Hundredfold..... O. B. Parks, Westfield	93 (R)	July
430	Bush Sutton's Excelsior..... Salem Hardware Co., Salem	80	May
572	American Wonder..... Orange Hardware Co., Orange	90	June
590	Laxtonia..... Knight Grain Co., Newburyport	90	June
282	FERRY-MORSE SEED CO., Detroit, Mich. Nott's Excelsior..... Sears, Roebuck & Co., Norwood	89	April
96	J. J. H. GREGORY & SONS, Marblehead, Mass. Dark Podded Sutton Excelsior..... J. J. H. Gregory & Sons, Marblehead	82	May
244	CHARLES C. HART SEED CO., Wethersfield, Conn. Tall Telephone..... Carr Hardware Co., Pittsfield	79	July
562	LEONARD SEED CO., Chicago, Ill. Nott's Excelsior..... (Wholesaler's germination test—90%) A. E. Stewart Estate, Athol	93	June
592	OLDS & WHIPPLE, Hartford, Conn. Telephone..... Harvey Hardware Co., Falmouth	92	June
201	PAGE SEED CO., Greene, N. Y. Dark Podded Telephone..... A. E. Sherman, Lanesboro	47 (R)	June
28	W. G. PEARSE, Fall River, Mass. Gradus..... C. S. Sawyer, Fall River	85	April
21	JEROME B. RICE SEED CO., Cambridge, N. Y. Sutton's Excelsior..... George E. Doane, Middleboro	93	May
22	World's Record..... George E. Doane, Middleboro	87	May
182	Nott's Excelsior..... R. A. Stacey & Sons, Williamstown	93	May

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
PEAS—Concluded			
550	Champion of England..... (Wholesaler's germination test—92%) S. Allen's Sons, Greenfield	84 (R)	June
84	F. H. WOODRUFF & SONS, Milford, Conn. Laxton Rogers..... John Shea Co., North Andover	83	May
146	Improved Telephone..... George Methe, Springfield	90	June
553	Champion of England..... F. I. Webster Co., Greenfield	86 (R)	July
579	Thomas Laxton..... D. J. Mahoney, Haverhill	87 (R)	July
558	S. D. WOODRUFF & SONS, Orange, Conn. American Wonder..... W. E. Aubuchon Co., Inc., Orange	85	June
566	Laxtonia..... Greenfield Farmers Cooperative Exchange, Greenfield	63 (R)	July
575	Telephone Pole..... Central Hardware Co., Fitchburg	72 (R)	June
PEPPER			
441	JOSEPH BRECK & SONS CORP., Boston, Mass. Ruby King..... F. W. Carson, Quincy	56 (R)	May
365	CROSMAN SEED CO., East Rochester, N. Y. Ruby King..... (Wholesaler's germination test—60%) J. B. Sibley, Ware	70	May
768	THOMAS W. EMERSON CO., Boston, Mass. Large Red Bell or Bull Nose..... Eastman Hardware Store, Falmouth	65	June
760	LAKE SHORE SEED CO., Dunkirk, N. Y. Red Ball or Bull Nose..... Massey's, Newburyport	18 (R)	June
PUMPKIN			
759	THOMAS W. EMERSON CO., Boston, Mass. Small Sugar..... Massey's, Newburyport	89	June
769	Small Sugar..... Eastman Hardware Store, Falmouth	80	June
347	JEROME B. RICE SEED CO., Cambridge, N. Y. Sweet or Sugar..... John Shea Co., North Andover	71	May
331	ROSS BROS. CO., Worcester, Mass. Small Sugar..... J. William Howe Estate, Hingham	66	April
RADISH			
387	JOSEPH BRECK & SONS CORP., Boston, Mass. French Breakfast..... I. Stein, Plymouth	63 (R)	May
415	French Breakfast..... Hutchinson Hardware Co., Lynn	91	April
427	Scarlet Globe..... F. N. Osborne Co., Inc., Marblehead	81(R)	May
756	Scarlet Globe..... D. Cashman Hardware Co., Newburyport	90 (R)	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
RADISH—Continued			
366	CROSMAN SEED CO., East Rochester, N. Y. Early Round Deep Scarlet..... J. B. Sibley, Ware.	85	April
610	THOMAS W. EMERSON CO., Boston, Mass. Icicle..... Thomas W. Emerson Co., Boston	79 (R)	June
683	Scarlet Turnip Rooted..... England Bros., Pittsfield	87	May
246	FERRY-MORSE SEED CO., Detroit, Mich. Icicle..... Copeland Hardware Co., Taunton	92	April
328	Long Scarlet..... Walsh & Packard, Hingham	64	August
270	FREDONIA SEED CO., Fredonia, N. Y. Early Scarlet Globe..... C. S. Sawyer, Fall River	61 (R)	April
305	CHARLES C. HART SEED CO., Wethersfield, Conn. Early Scarlet Globe..... (Wholesaler's germination test—85%) Wilde's Store, Holbrook	82	April
361	Early Scarlet Globe..... (Wholesaler's germination test—85%) Grange Store, Amherst	78	April
440	Round Black Spanish..... (Wholesaler's germination test—85%) F. W. Carson, Quincy	82	May
704	French Breakfast..... (Wholesaler's germination test—80%) Burlingame & Darbys Co., North Adams	69 (R)	June
772	French Breakfast..... (Wholesaler's germination test—80%) D. M. Seabury & Sons, Barnstable	54 (R)	June
780	French Breakfast..... Mendelson's Hardware Co., Waltham	58 (R)	June
788	Scarlet Turnip..... F. W. Richardson, Waltham	86	June
615	HOVEY & CO., Boston, Mass. Early Scarlet Turnip White Top..... Hovey & Co., Boston	90	June
268	LAKE SHORE SEED CO., Dunkirk, N. Y. Early Red Turnip..... C. A. Gifford, Westport	29	April
279	NORTHRUP, KING & CO., Minneapolis, Minn. Early Scarlet Turnip, White Top..... F. W. Woolworth, Dedham	85	April
339	Long White Icicle..... Peboco Hardware Sales Co., Wellesley	84 (R)	May
444	OLDS & WHIPPLE, Hartford, Conn. Early Scarlet Globe..... W. H. Hill Hardware Co., Andover	70	August
251	JEROME B. RICE SEED CO., Cambridge, N. Y. True French Breakfast..... Pierce Hardware Co., Taunton	74 (R)	April
666	Early Scarlet..... (Wholesaler's germination test—92%) Frank Howard Inc., Pittsfield	85 (R)	June
814	Scarlet Globe..... Thomas J. Grey Co., Boston	77 (R)	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	Germination Found	1935 Month of Test
RADISH—Concluded			
359	ROSS BROS. CO., Worcester, Mass. Early Round Scarlet White Tipped..... H. S. Packard, Cummington	89	April
660	Scarlet Globe..... Ross Bros. Co., Worcester	83 (R)	May
238	F. H. WOODRUFF & SONS, Milford, Conn. French Breakfast..... Peirson Hardware Co., Pittsfield	92	May
733	French Breakfast..... Fitchburg Hardware Co., Fitchburg	73 (R)	June
737	Early Long Scarlet Short Top..... Union Hardware Co., Fitchburg	82 (R)	June
716	S. D. WOODRUFF & SONS, Orange, Conn. Early Scarlet Globe..... W. E. Aubuchon Co., Orange	74 (R)	May
RUTA BAGA			
642	JOSEPH BRECK & SONS CORP., Boston, Mass. Improved American Purple..... C. Skelton & Sons, Newton Centre	82	July
404	CROSMAN SEED CO., East Rochester, N. Y. American Purple Top..... J. B. Sibley, Ware	65 (R)	July
700	JEROME B. RICE SEED CO., Cambridge, N. Y. American Purple Top..... Payne-Cummings Hardware Co., North Adams	92	July
718	S. D. WOODRUFF & SONS, Orange, Conn. American Purple Top..... W. E. Aubuchon Co., Orange	96	July
SALSIFY			
346	FERRY-MORSE SEED CO., Detroit, Mich. Vegetable Oyster Mammoth Sandwich Island..... William Westland Co., Quincy	91	May
640	Vegetable Oyster Mammoth Sandwich Island..... C. Skelton & Sons, Newton Centre	93	May
SPINACH			
597	JOSEPH BRECK & SONS CORP., Boston, Mass. Princess Juliana..... H. V. Lawrence, Falmouth	87	June
653	Bloomdale or Savoy..... Danaher Hardware Co., Williamstown	85	May
755	Round Thick Leaved..... D. Cashman Hardware Co., Newburyport	77 (R)	June
787	Giant Round Thick Leaved..... F. W. Richardson Hardware Co., Waltham	80 (R)	June
367	CROSMAN SEED CO., East Rochester, N. Y. Bloomdale..... J. B. Sibley, Ware	69 (R)	May
48	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Dark Green Bloomsdale..... (Wholesaler's soil test—86%) Jan. Eastern States Farmers Exchange, Taunton	78 (R)	May
611	THOMAS W. EMERSON CO., Boston, Mass. Bloomsdale..... Thomas W. Emerson Co., Boston	93	June
612	Long Standing..... Thomas W. Emerson Co., Boston	92	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
SPINACH—Concluded			
750	Bloomsdale..... Staples Hardware Co., Haverhill	83	June
330	FERRY-MORSE SEED CO., Detroit, Mich. Savoy Leaved..... Walsh & Packard, Hingham	88	May
98	J. J. H. GREGORY & SONS, Marblehead, Mass. Bloomsdale, Savoy Leaved..... J. J. H. Gregory & Sons, Marblehead	88	May
65	CHARLES C. HART SEED CO., Wethersfield, Conn. Bloomsdale Savoy..... Federal Supply Co., Northampton	83	May
727	Thick Leaf..... C. F. Page Hardware Co., Athol	77	June
783	Early Giant Thick Leaf..... Waltham Supply Co., Waltham	77	June
781	LEONARD SEED CO., Chicago, Ill. Spinach..... Mendelson's Hardware Co., Waltham	87	June
297	NORTHROP, KING & CO., Minneapolis, Minn. Round Thick Leaved..... Samuel Kashden, Walpole	65 (R)	May
764	OLDS & WHIPPLE, Hartford, Conn. King of Denmark..... Harvey Hardware Co., Falmouth	81	June
668	JEROME B. RICE SEED CO., Cambridge, N. Y. King of Denmark..... (Wholesaler's germination test—80%) Frank Howard Inc., Pittsfield	82	May
778	ROSS BROS. CO., Worcester, Mass. Giant Thick Leaf..... Hyannis Hardware Co., Hyannis	89	August
239	F. H. WOODRUFF & SONS, Milford, Conn. Bloomsdale, Savoy Leaved..... Peirson Hardware Co., Pittsfield	77	May
743	S. D. WOODRUFF & SONS, Orange, Conn. Long Standing..... Central Hardware Co., Fitchburg	81	June
817	ZWAAN & VANDER MOLLEN INC., Holland Round Thick Leaf..... (Wholesaler's germination test—90%) Thomas J. Grey Co., Boston	83 (R)	July
SQUASH			
285	JOSEPH BRECK & SONS CORP., Boston, Mass. Golden Summer Crookneck..... Town Square Hardware & Plumbing Supply Co., Norwood	99	April
385	Blue Hubbard..... I. Stein, Plymouth	60	April
160	COMSTOCK, FERRE & CO., Wethersfield, Conn. Early Giant Summer..... Carlisle Hardware Co., Springfield	83	May
752	THOMAS W. EMERSON CO., Boston, Mass. Golden Hubbard..... Staples Hardware Co., Haverhill	80 (R)	July
758	Golden Hubbard..... Massey's Newburyport	80	June
95	J. J. H. GREGORY & SONS, Marblehead, Mass. Blue Hubbard..... J. J. H. Gregory & Sons, Marblehead	99	May

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
SQUASH—Concluded			
451	THOMAS J. GREY CO., Boston, Mass. Delicious..... Thomas J. Grey Co., Boston	88	June
256	CHARLES C. HART SEED CO., Wethersfield, Conn. Cocozelle Italian Vegetable Marrow..... (Wholesaler's germination test—85+%) C. F. Delano Hardware and Plumbing Co., Fairhaven	83	April
313	Giant Summer Crookneck..... (Wholesaler's germination test—97+%) Wilde's Store, Holbrook	97	May
364	Giant Summer Crookneck..... (Wholesaler's germination test—97%) Grange Store, Amherst	96	May
728	Summer Crookneck..... C. F. Page Hardware Co., Athol	78	June
775	Giant Summer Crookneck..... (Wholesaler's germination test—97%) D. M. Seabury & Sons, Barnstable	95	May
806	HOVEY & CO., Boston, Mass. Giant Crookneck..... Hovey & Co., Boston	80 (R)	June
319	JEROME B. RICE SEED CO., Cambridge, N. Y. Early White Bush Scallop..... Sawyer Hardware Co., Canton	90	May
446	Giant Early Summer Crookneck..... John Shea Co., North Andover	86	May
549	True Hubbard..... (Wholesaler's germination test—90%) S. Allen's Sons, Greenfield	94	June
665	True Hubbard..... R. A. Stacey & Sons, Williamstown	65 (R)	May
434	ROSS BROS. CO., Worcester, Mass. Green Hubbard..... H. S. Packard, Cummington	76	May
622	Golden Hubbard..... Harvard Square Hardware Co., Cambridge	66	May
576	S. D. WOODRUFF & SONS, Orange, Conn. Golden Summer Crookneck..... Central Hardware Co., Fitchburg	83	June
717	Golden Summer Crookneck..... W. E. Aubuchon Co., Orange	96	May
SWISS CHARD			
287	JOSEPH BRECK & SONS CORP., Boston, Mass. Lucullus..... Town Square Hardware & Plumbing Supply Co., Norwood	82	May
707	EASTERN STATES FARMERS EXCHANGE, Springfield, Mass. Fordhook Giant No. 10B 1315..... (Wholesaler's germination test—75%) Eastern States Farmers Exchange, Springfield	74 (R)	May
447	FERRY-MORSE SEED CO., Detroit, Mich. Spinach Beet..... Harvard Square Hardware Co., Cambridge	85	June
298	NORTHRUP, KING & CO., Minneapolis, Minn. Spinach Beet..... Samuel Kashden, Walpole	80	May
573	F. H. WOODRUFF & SONS, Milford, Conn. Swiss Chard Beet..... Union Hardware Co., Fitchburg	77 (R)	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	% Germination Found	1935 Month of Test
<b>TOMATO</b>			
288	JOSEPH BRECK & SONS CORP., Boston, Mass. Earliana..... Town Square Hardware & Plumbing Supply Co., Norwood	46 (R)	May
388	Dwarf Champion..... I. Stein, Plymouth	89	May
423	Dwarf Champion..... George H. Holden, Swampscott	83	May
425	Stone..... F. N. Osborne Co., Inc., Marblehead	92	May
631	Earliana..... J. H. Chandler Hardware Co., Newton Centre	45 (R)	May
678	THOMAS W. EMERSON CO., Boston, Mass. New Stone..... England Bros., Pittsfield	82	May
391	CHARLES C. HART SEED CO., Wethersfield, Conn. Bonny Best..... (Wholesaler's germination test—90%) Griffin Bros., Wareham	94	May
262	LAKE SHORE SEED CO., Dunkirk, N. Y. Ponderosa..... Henry Perry, Rivet St., New Bedford	68	April
265	New Stone..... C. A. Gifford, Westport	58	April
349	JEROME B. RICE SEED CO., Cambridge, N. Y. Marglobe..... John Shea Co., North Andover	88	May
679	Livingston Beauty..... (Wholesaler's germination test—90%) Frank Howard Inc., Pittsfield	93	May
731	F. H. WOODRUFF & SONS, Milford, Conn. Chalk's Early Jewel..... Fitchburg Hardware Co., Fitchburg	88	June
747	Red Pea..... D. J. Mahoney Hardware Co., Haverhill	73 (R)	June
790	WHOLESALE UNKNOWN Stone..... F. W. Richardson, Waltham	39	June
<b>TURNIP</b>			
771	JOSEPH BRECK & SONS CORP., Boston, Mass. Early Snowball..... H. V. Lawrence, Falmouth	47 (R)	July
275	COMSTOCK, FERRE & CO., Wethersfield, Conn. White Egg..... (Wholesaler's germination test—89%) J. O. Neil Hardware Co., Fall River	84	July
751	THOMAS W. EMERSON CO., Boston, Mass. Purple Top White Globe..... Staples Hardware Co., Haverhill	91	June
800	FERRY-MORSE SEED CO., Detroit, Mich. Purple Top White Globe..... Sinclair Hardware Co., Medford	87 (R)	July
257	CHARLES C. HART SEED CO., Wethersfield, Conn. Yellow Globe..... (Wholesaler's germination test—80%) C. F. Delano Hardware & Plumbing Co., Fairhaven	69 (R)	July
389	American Purple Top Yellow Ruta Baga..... (Wholesaler's germination test—75+%) Griffin Bros., Wareham	80	July

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer when other than Wholesale Distributor, and Place Collected	Germination Found	1935 Month of Test
TURNIP—Concluded			
729	White Egg..... C. F. Page Hardware Co., Athol	60 (R)	July
795	JEROME B. RICE SEED CO., Cambridge, N. Y. Early Red or Purple Top Strap Leaf..... Andrew F. Curtin & Sons, Medford	88	July
433	ROSS BROS. CO., Worcester, Mass. Purple Top White Globe..... H. S. Packard, Cummington	76 (R)	July
621	White Egg..... Harvard Square Hardware Co., Cambridge	80 (R)	July
732	F. H. WOODRUFF & SONS, Milford, Conn. White Egg..... Fitchburg Hardware Co., Fitchburg	79 (R)	July
741	Snowball, No. 1..... Union Hardware Co., Fitchburg	88	July

## WATERMELON

384	CHARLES C. HART SEED CO., Wethersfield, Conn. Kleckley's Sweet..... (Wholesaler's germination test—80+%) Sherman Co., Plymouth	92	April
644	Kleckley's Sweet..... (Wholesaler's germination test—80%) J. Russell & Co., Holyoke	60	May



## Type and Variety Studies of Vegetables

Conducted in Conjunction with the Department of Vegetable Gardening  
Professor Grant B. Snyder

A large majority of home gardeners buy their vegetable seeds from the neighborhood store. The commercial grower may also buy from this source if he runs short or has forgotten to order a certain crop from his regular seedsman. These various stores and shops in the neighborhood community are, therefore, important sources of garden seeds.

It has been found that in a fair percentage of cases, seed purchased from these sources has been variable in germination and in trueness to name. In order to definitely check the performance of packet and bulk seed sold by these merchants, the Department of Vegetable Gardening has cooperated with the Seed Laboratory in making germination tests and in checking the trueness to name of samples purchased on the open market by state inspectors.

Some 207 lots were included in the field trials, comprising beans, beets, carrots, cucumbers, lettuce, onions, parsnips, radishes, spinach, squash, sweet corn and turnips.

Field notes on germination indicated fairly good vitality of most lots. The greatest variation was noted in beans and lettuce where a few lots failed to germinate and others germinated from 30 to 60 per cent. Spinach failed to germinate because of adverse weather conditions at the time of planting.

The various lots were surprisingly true to the name printed on the seed packet. There were only a very few cases where off types were noted, and even where observed, the percentage was very small.

Seeds with most of these stores are a side line. The person selling them has little or no knowledge of what is being sold other than the information printed on the packet and the price. The conditions under which the seed is stored and displayed are too frequently very poor, resulting in poor germination when planted in the garden. Most of the varieties sold are old standard sorts. Newer improved varieties are generally not listed.

Lot No.	Variety and Source	Remarks
<b>BEANS</b>		
36	Bountiful Green Pod..... JOSEPH BRECK & SONS CORP. G. E. Warren, Braintree	True to name, performance satisfactory
431	Burpee's Stringless Bush Bean..... THOMAS W. EMERSON CO. Salem Hardware Co., Salem	
24	Burpee's Stringless Green Pod..... JEROME B. RICE SEED CO. Sherman Co., Plymouth	
30	Low's Champion..... COMSTOCK, FERRE & CO. J. O. Neil Hardware Co., Fall River	Badly diseased (mosaic)
620	Red Valentine..... FERRY-MORSE SEED CO. Harvard Square Hardware Co., Cambridge	True to name, performance satisfactory
422	Stringless Green Pod..... JOSEPH BRECK & SONS CORP. George H. Holden, Swampscott	
577	Tendergreen or New Stringless..... F. H. WOODRUFF & SONS D. J. Mahoney Hardware Co., Haverhill	
37	Black Wax Improved Prolific..... JOSEPH BRECK & SONS CORP. G. E. Warren, Braintree	Failed to germinate
561	Burpee's Improved Stringless Kidney Wax..... LEONARD SEED CO. A. E. Stewart Estate, Athol	
27	Davis White Wax Early..... LEONARD SEED CO. Hand Hardware Co., New Bedford	
420	Dwarf Rust Golden Wax..... JEROME B. RICE SEED CO. George H. Holden, Swampscott	True to name, performance satisfactory
284	Ferry's Golden Wax..... FERRY-MORSE SEED CO. Sears, Roebuck & Co., Norwood	
183	Golden Wax Dwarf..... JEROME B. RICE SEED CO. R. A. Stacey & Sons, Williamstown	
260	Improved Golden Wax..... CHARLES C. HART SEED CO. Hayes, New Bedford	Failed to germinate
94	New Kidney Wax..... J. J. H. GREGORY & SONS J. J. H. Gregory & Sons, Marblehead	
19	Wardwell's Kidney Wax..... JEROME B. RICE SEED CO. George E. Doane, Middleboro	
225	Weber Wax Bush..... D. LANDRETH SEED CO. Elwood Adams, Inc., Worcester	Failed to germinate
2	Dwarf Horticultural..... JOSEPH BRECK & SONS CORP. M. A. Gray, East Bridgewater	
217	Dwarf Horticultural..... CHARLES C. HART SEED CO. Waite Hardware Co., Worcester	
224	Henderson's Dwarf Lima..... D. LANDRETH SEED CO. Elwood Adams, Inc., Worcester	

Lot No.	Variety and Source	Remarks
<b>BEETS</b>		
333	Early Egyptian..... ROSS BROS. CO.	
	J. William Howe Estate, Hingham	
253	Early Wonder..... CHARLES C. HART SEED CO.	
	Pierce Hardware Co., Taunton	
377	Early Wonder..... CHARLES C. HART SEED CO.	
	I. F. Porter, Pembroke	
657	Early Wonder..... ROSS BROS. CO.	
	Ross Bros. Co., Worcester	
675	Egyptian Blood..... CHARLES C. HART SEED CO.	
	Waite Hardware Co., Worcester	
673	Detroit Dark Red..... D. LANDRETH SEED CO.	
	Elwood Adams, Inc., Worcester	
295	Detroit Dark Red..... PAGE SEED CO., Greene, N. Y.	True to name, performance satisfactory
	H. A. Spear & Son, Walpole	
406	Detroit Dark Red..... PAGE SEED CO.	
	J. F. Robinson Co., Ware	
272	Dewing's Early Blood..... JOSEPH BRECK & SONS CORP.	
	W. Greenhalgh & Sons, Fall River	
314	Red Egyptian..... JOSEPH BRECK & SONS CORP.	
	Wilde's Store, Holbrook	
386	Red Egyptian..... JOSEPH BRECK & SONS CORP.	
	I. Stein, Plymouth	
652	Mangel Wurzel..... JOSEPH BRECK & SONS CORP.	
	Danaher Hardware Co., Williamstown	
<b>CABBAGE</b>		
693	All Season..... JEROME B. RICE SEED CO.	
	Frank Howard Inc., Pittsfield	
334	Copenhagen Market..... ROSS BROS. CO.	
	J. William Howe Estate, Hingham	
713	Copenhagen Market..... F. H. WOODRUFF & SONS	
	F. I. Webster Co., Greenfield	
676	Danish Ballhead..... CHARLES C. HART SEED CO.	
	Waite Hardware Co., Worcester	
311	Danish Ballhead..... FREDONIA SEED CO.	
	Cutliff Market, Braintree	
816	Danish Ballhead..... SLUIS & GROOT	
	Thomas J. Grey Co., Boston	
746	Danish Ballhead..... F. H. WOODRUFF & SONS	
	D. J. Mahoney Hardware Co., Haverhill	
749	Drumhead Savoy..... THOMAS W. EMERSON CO.	True to name, performance satisfactory
	Staples Hardware Co., Haverhill	
426	Early Jersey Wakefield..... JOSEPH BRECK & SONS CORP.	
	F. N. Osborn Co. Inc., Marblehead	
720	Early Jersey Wakefield..... JEROME B. RICE SEED CO.	
	S. Allen's Sons, Greenfield	
358	Danish Ballhead..... CHARLES C. HART SEED CO.	
	J. Niedbala, Hadley	
773	Premium Late Flat Dutch..... CHARLES C. HART SEED CO.	
	D. M. Seabury & Sons, Barnstable	
247	Savoy..... JOSEPH BRECK & SONS CORP.	
	Copeland Hardware Co., Taunton	
296	Large Drumhead Stone Mason..... THOMAS W. EMERSON CO.	
	H. A. Spear & Sons, Walpole	
735	Stone Mason..... F. H. WOODRUFF & SONS	
	Fitchburg Hardware Co., Fitchburg	
625	Warren Stone Mason..... JOSEPH BRECK & SONS CORP.	
	C. G. McMullin, Newton Highlands	

Lot No.	Variety and Source	Remarks
<b>CARROTS</b>		
258	Chantenay..... JOSEPH BRECK & SONS CORP. DeWolf and Vincent, New Bedford	True to name, performance satisfactory
286	Chantenay..... JOSEPH BRECK & SONS CORP. Town Square Hardware & Plumbing Supply Co., Norwood	
627	Chantenay..... FERRY-MORSE SEED CO. C. G. McMullin, Newton Highlands	
341	Chantenay..... NORTHRUP KING & CO. Peboco Hardware Sales Co., Wellesley	True to name, performance satisfactory; 1 seed stalk
779	Danvers..... LEONARD SEED CO. Mendelson's Hardware Co., Waltham	
309	Danvers, Half Long..... JOSEPH BRECK & SONS CORP. Winer's Hardware Co., South Braintree	
156	Danvers Half Long..... COMSTOCK, FERRE & CO. Carlisle Hardware Co., Springfield	True to name, performance satisfactory
724	Danvers Half Long..... THOMAS W. EMERSON CO. Orange Hardware Co., Orange	
692	Danvers Half Long..... JEROME B. RICE SEED CO. Frank Howard Inc., Pittsfield	
419	Danvers Half Long..... ROSS BROS. CO. Lynn Hardware Co., Lynn	True to name, performance satisfactory; 1 seed stalk
714	Danvers Half Long..... F. H. WOODRUFF & SONS F. I. Webster Co., Greenfield	
252	Danvers Half Long, Stump Root..... C. C. HART SEED CO., Wethersfield, Conn. Pierce Hardware Co., Taunton	
362	Danvers Half Long, Stump Root..... C. C. HART SEED CO. Grange Store, Amherst	True to name, performance satisfactory
439	Danvers Half Long, Stump Root..... C. C. HART SEED CO. F. W. Carson, Quincy	
413	Early French Short Horn..... JEROME B. RICE SEED CO. L. W. Jenney, South Carver	
274	Long Orange..... JOSEPH BRECK & SONS CORP. W. Greenhalgh & Sons, Fall River	True to name, performance satisfactory; 1 seed stalk
424	Long Orange..... JOSEPH BRECK & SONS CORP. F. N. Osborne Co., Inc., Marblehead	
734	Long Orange..... F. H. WOODRUFF & SONS Fitchburg Hardware Co., Fitchburg	
662	New Oxheart Orange..... JEROME B. RICE SEED CO. R. A. Stacey & Sons, Williamstown	True to name, performance satisfactory; 1 seed stalk
708	Danvers Half Long, Tapering Late..... EASTERN STATES FARMERS EXCHANGE Eastern States Farmers Exchange, Springfield	

Lot No.	Variety and Source	Remarks
<b>SWEET CORN</b>		
76	Bantam Evergreen..... THOMAS W. EMERSON CO. W. R. Hill Hardware Co., Andover	
200	Bantam Evergreen..... PAGE SEED CO. A. E. Sherman, Lanesboro	
100	Carpenter's Golden..... J. J. H. GREGORY & SONS B. F. Hill Co., Salem	
580	Early Yellow Sensation..... F. H. WOODRUFF & SONS D. J. Mahoney Hardware Co., Haverhill	
35	Golden Bantam..... JOSEPH BRECK & SONS CORP. G. E. Warren, Braintree	
41	Early Sensation..... JOSEPH BRECK & SONS CORP. The Welch Co., Scituate	
539	Golden Bantam..... O. & M. SEED CO. Berkshire Coal & Grain Co., North Adams	
134	Golden Bantam..... JEROME B. RICE SEED CO. The Wells Hardware Co., Holyoke	
147	Golden Bantam..... WHITNEY-ECKSTEIN SEED CO. Charles E. Terry, West Springfield	
40	Golden Dawn..... JOSEPH BRECK & SONS CORP. The Welch Co., Scituate	
521	Golden Early Market..... EASTERN STATES FARMERS EXCHANGE Eastern States Farmers Exchange, Springfield	
4	Golden Giant..... JOSEPH BRECK & SONS CORP. M. A. Gray, East Bridgewater	
619	Golden Sunshine..... LEONARD SEED CO. Mendelson's Hardware Co., Waltham	True to name, performance satisfactory
80	Golden Sunrise..... JOSEPH BRECK & SONS CORP. Lynn Bird & Seed Co., Lynn	
216	Whipple's Early Yellow..... C. C. HART SEED CO. Waite Hardware Co., Worcester	
20	Whipple's Early Yellow..... JEROME B. RICE SEED CO. George E. Doane, Middleboro	
157	Whipple's Yellow..... COMSTOCK, FERRE & CO. Carlisle Hardware Co., Springfield	
520	Whipple's Yellow..... THOMAS W. EMERSON CO. O. B. Parks Co., Westfield	
245	Black Mexican..... C. C. HART SEED CO. Carr Hardware Co., Pittsfield	
47	Country Gentleman..... EASTERN STATES FARMERS EXCHANGE Eastern States Farmers Exchange, Taunton	
26	Potter's Excelsior Medium Early..... LEONARD SEED CO. Hand Hardware Co., New Bedford	
283	Stowell's Evergreen..... FERRY-MORSE SEED CO. Sears, Roebuck & Co., Norwood	

Lot No.	Variety and Source	Remarks
<b>CUCUMBERS</b>		
443	Arlington White Spine..... OLDS & WHIPPLE, Hartford, Conn. W. R. Hill Hardware Co., Andover	
628	Boston Pickling..... FERRY-MORSE SEED CO. C. G. McMullin, Newton Highlands	
674	Davis Perfect..... C. C. HART SEED CO. Waite Hardware Co., Worcester	
803	Davis Perfect..... HOVEY & CO. Hovey & Co., Boston	
318	Davis Perfect..... JEROME B. RICE SEED CO. Sawyer Hardware Co., Canton	
312	Early White Spine..... FREDONIA SEED CO. Cutcliff Market, Braintree	
360	Early White Spine..... ROSS BROS. CO. H. S. Packard, Cummington	
161	Improved Long Green..... COMSTOCK, FERRE & CO. Carlisle Hardware Co., Springfield	True to name. performance satisfactory
725	Improved Long Green..... THOMAS W. EMERSON CO. Orange Hardware Co., Orange	
435	Improved Long Green..... C. C. HART SEED CO. Winer's Inc., Quincy	
738	Improved Long Green..... F. H. WOODRUFF & SONS Union Hardware Co., Fitchburg	
761	Improved White Spine..... THOMAS W. EMERSON CO. Knight Grain Co., Newburyport	
376	Improved White Spine..... C. C. HART SEED CO. I. F. Porter, Pembroke	
355	Improved White Spine..... NORTHRUP KING & CO. Murphy Hardware Co., Salem	
632	Long Green White Spine..... FERRY-MORSE SEED CO. J. H. Chandler Hardware Co., Newton Centre	
691	Snow's Pickling..... JEROME B. RICE SEED CO. Frank Howard Inc., Pittsfield	
<b>LETTUCE</b>		
271	Black Seeded Simpson..... FREDONIA SEED CO. C. S. Sawyer, Fall River	True to name, performance satisfactory
421	Black Seeded Simpson..... JEROME B. RICE SEED CO. George H. Holden, Swampscott	
442	Black Seeded Tennisball..... JOSEPH BRECK & SONS CORP. F. W. Carson, Quincy	Failed to germinate
381	Tennisball, Black Seeded..... THOMAS W. EMERSON CO. H. T. Clark, Hanson	
315	Big Boston..... JEROME B. RICE SEED CO. Wilde's Store, Holbrook	True to name, performance satisfactory
690	Big Boston..... JEROME B. RICE SEED CO. Frank Howard Inc., Pittsfield	
715	Big Boston..... F. H. WOODRUFF & SONS F. I. Webster Co., Greenfield	True to name, 2 plants off type
267	Early Curled Silesia..... FREDONIA SEED CO. C. A. Gifford, Westport.	True to name, performance satisfactory
350	Early Prize Head..... FERRY-MORSE SEED CO. B. F. Hill Co., Salem	
726	Early Prize Head..... CHARLES C. HART SEED CO. C. F. Page Hardware Co., Athol	Failed to germinate

Lot No.	Variety and Source	Remarks	
LETTUCE—Concluded			
293	Iceberg Head..... PAGE SEED CO. H. A. Spear & Son, Walpole	True to name, performance satisfactory	
776	Light Iceberg..... ROSS BROS. CO. Hyannis Hardware Co., Hyannis		
340	New York Special or Los Angeles Market..... NORTHRUP KING & CO. Peboco Hardware Sales Co., Wellesley		
719	Prize Head..... S. D. WOODRUFF & SONS..... W. E. Aubuchon Co., Orange		
682	Prize Head..... THOMAS W. EMERSON CO. .... England Bros., Pittsfield		
255	Early Curled Simpson..... EASTERN STATES FARMERS EXCHANGE Eastern States Farmers Exchange, Taunton		
736	Early Curled Simpson..... F. H. WOODRUFF & SONS Fitchburg Hardware Co., Fitchburg...		
304	Early Curled Simpson..... CHARLES C. HART SEED CO. Bellingham Hardware Co., Weymouth		
813	White Boston..... ASSOCIATED SEED GROWERS, INC. Thomas J. Grey & Co., Boston		
375	Romaine or White Cos..... CHARLES C. HART SEED CO. I. F. Porter, Pembroke		
ONION			
254	Ebenezer..... EASTERN STATES FARMERS EXCHANGE Eastern States Farmers Exchange, Taunton		True to name, performance satisfactory
670	Large Red Wethersfield..... BUDD D. HAWKINS, Reading, Vt. Elwood Adams, Inc., Worcester		
705	Large Red Wethersfield..... CHARLES C. HART SEED CO. Burlingame & Darbys Co., North Adams		
177	Prizetaker..... JEROME B. RICE SEED CO. Payne Cummings Hardware Co., North Adams		
269	Red Globe..... W. G. PEARSE, Fall River C. A. Sawyer, Fall River		
154	Select Danvers Yellow Globe..... COMSTOCK, FERRE & CO. Carlisle Hardware Co., Springfield		
696	Yellow Globe Danvers..... EASTERN STATES FARMERS EXCHANGE Eastern States Farmers Exchange, Springfield		
329	Yellow Globe Danvers..... FERRY-MORSE SEED CO. Walsh & Packard, Hingham		
303	Yellow Globe Danvers..... CHARLES C. HART SEED CO. Bellingham Hardware Co., Weymouth		
684	Yellow Globe Danvers..... NORTHRUP KING & CO. Peirson Hardware Co., Pittsfield		
664	Yellow Globe Danvers..... JEROME B. RICE SEED CO. R. A. Stacey & Sons, Williamstown		
689	Yellow Globe Danvers..... JEROME B. RICE SEED CO. Frank Howard Inc., Pittsfield		
638	Yellow Globe Danvers..... ROSS BROS. CO. Ross Bros. Co., Worcester		

Lot No.	Variety and Source	Remarks
PARSNIP		
742	Guernsey or Sweet Marrow..... S. D. WOODRUFF & SONS Central Hardware Co., Fitchburg	} True to name, performance satisfactory
626	Hollow Crown..... JOSEPH BRECK & SONS CORP. C. G. McMullin, Newton Highlands	
276	Hollow Crown..... COMSTOCK, FERRE & CO. J. O. Neil Hardware Co., Fall River	
432	Hollow Crown..... THOMAS W. EMERSON CO. Salem Hardware Co., Salem	
325	Hollow Crown..... FERRY-MORSE SEED CO. Bellingham Hardware Co., Weymouth	
354	Hollow Crown..... FERRY-MORSE SEED CO. Murphy Hardware Co., Salem	
356	Hollow Crown..... CHARLES C. HART SEED CO. J. Niedbala, Hadley	
407	Hollow Crown..... PAGE SEED CO. J. F. Robinson Co., Ware	
701	Hollow Crown..... JEROME B. RICE SEED CO. Payne Cummings Hardware Co., North Adams	
685	Improved Hollow Crown..... NORTHROP KING & CO. Peirson Hardware Co., Pittsfield	
688	Student..... JEROME B. RICE SEED CO. Frank Howard Inc., Pittsfield	
RADISH		
268	Early Red Turnip..... LAKE SHORE SEED CO. C. A. Gifford, Westport	} True to name, performance satisfactory
716	Early Scarlet Globe..... S. D. WOODRUFF & SONS W. E. Aubuchon Co., Orange	
305	Early Scarlet Globe..... CHARLES C. HART SEED CO. Wilde's Store, Holbrook	
361	Early Scarlet Globe..... CHARLES C. HART SEED CO. Grange Store, Amherst	
660	Scarlet Globe..... ROSS BROS. CO. Ross Bros. Co., Worcester	} True to name, performance satisfactory (Excellent)
683	Scarlet Turnip Rooted..... THOMAS W. EMERSON CO. England Bros., Pittsfield	
615	Early Scarlet Turnip White Top..... HOVEY & CO. Hovey & Co., Boston	} True to name, performance satisfactory
737	Early Long Scarlet Short Top..... F. H. WOODRUFF & SONS Union Hardware Co., Fitchburg	
387	French Breakfast..... JOSEPH BRECK & SONS CORP. I. Stein, Plymouth	Germinated poorly in field



Lot No.	Variety and Source	Remarks	
RADISH—Concluded			
415	French Breakfast..... JOSEPH BRECK & SONS CORP. Hutchinson Hardware Co., Lynn	True to name, performance satisfactory	
733	French Breakfast..... F. H. WOODRUFF & SONS Fitchburg Hardware Co., Fitchburg		
704	French Breakfast..... CHARLES C. HART SEED CO. Burlingame & Darbys Co., North Adams		
772	French Breakfast..... CHARLES C. HART SEED CO. D. M. Seabury & Sons, Barnstable		
238	French Breakfast..... F. H. WOODRUFF & SONS Peirson Hardware Co., Pittsfield		
246	{Icicle (Red Package)..... {Icicle (Blue Package)..... FERRY-MORSE SEED CO. Copland Hardware Co., Taunton		
328	Long Scarlet..... FERRY-MORSE SEED CO. Walsh & Packard, Hingham		
SQUASH			
160	Early Giant Summer..... COMSTOCK, FERRE & CO. Carlisle Hardware Co., Springfield		True to name, performance satisfactory
319	Early White Bush Scallop..... JEROME B. RICE SEED CO. Sawyer Hardware Co., Canton		
446	Giant Early Summer Crookneck..... JEROME B. RICE SEED CO. John Shea Co., North Andover		
364	Giant Summer Crookneck..... CHARLES C. HART SEED CO. Grange Store, Amherst		
775	Giant Summer Crookneck..... CHARLES C. HART SEED CO. D. M. Seabury & Sons, Barnstable		
451	Delicious..... THOMAS J. GREY CO. Thomas J. Grey Co., Boston		
TURNIP			
389	American Purple Top Yellow Ruta Baga..... CHARLES C. HART SEED CO. Griffin Bros., Wareham	True to name, performance satisfactory	

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MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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Inspection of Commercial  
Fertilizers

By H. D. Haskins

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This is the sixty-second report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

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Massachusetts State College,  
Amherst, Mass.

# INSPECTION OF COMMERCIAL FERTILIZERS FOR THE SEASON OF 1935

By H. D. Haskins, Official Chemist<sup>1</sup>

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## MANUFACTURERS AND BRANDS

Registrations have been perfected in Massachusetts during 1935 by 91 firms, covering 489 brands of mixed fertilizer and unmixed fertilizing materials. The nature of these products is shown by the following classification:

Complete fertilizers . . . . .	284
Ammoniated superphosphates . . . . .	5
Superphosphates with potash . . . . .	1
Dry ground fish, tankage and ground bone . . . . .	53
Fertilizer simples, including organic nitrogen compounds . . . . .	95
Tobacco stems . . . . .	1
Pulverized manures . . . . .	32
Cotton hull ashes and wood ashes . . . . .	4
Peat products . . . . .	6
Stone meal . . . . .	2
Nitrate of potash . . . . .	6
 Total . . . . .	 489

<sup>1</sup> Assisted by H. Robert DeRose, Albert F. Spelman, J. W. Kuzmeski, Karol Kucinski, Chemists; James T. Howard, C. L. Whiting, G. E. Taylor, Sampling Agents; Harry L. Allen, Laboratory Assistant; Cora B. Grover, Clerk.

Samples of the following brands were not drawn as they were not found on display by our sampling agents.

### Brands of Fertilizer Registered but Not Sampled.

MANUFACTURER AND BRAND.	MANUFACTURER AND BRAND.
<b>Acme Guano Co.</b> Acme 4-8-7 Acme 7-6-6 Sheep Manure (1.25-1-2)	<b>Humphreys-Godwin Co.</b> Bull Brand Cottonseed Meal (6.87-0-0)
<b>Apothecaries Hall Co.</b> Castor Pomace (4.52-0-0) Dry Ground Fish (9.46-5-0)	<b>New England Chemical Industries, Inc.</b> Inedible Bone Meal
<b>Armour Fertilizer Works</b> Armours Big Crop Fertilizer 4-12-4 Nitrate of Soda (16-0-0)	<b>Rogers &amp; Hubbard Co.</b> Cotton Hull Ashes (0-0-30) Linseed Meal (5-0-0) Nitrate of Potash (13-0-44)
<b>Eastern States Farmers' Exchange</b> E. S. 20% Superphosphate E. S. 40% Double Superphosphate	<b>Victory Fertilizer Corp.</b> Victory Humus (.5-0-0)

### Drawing of Samples.

Between April 1 and June 15, three sampling agents made a thorough canvass of the state: James T. Howard in Hampshire, Hampden, Franklin and Berkshire Counties; G. E. Taylor in Norfolk, Bristol, Plymouth, Barnstable and Dukes Counties; and C. L. Whiting in Essex, Middlesex, Suffolk and Worcester Counties. They visited 209 towns, took 1,967 samples, representing 470 brands, from stock in the possession of 598 agents or owners, and called upon 335 agents where no samples were drawn because the agency had been discontinued, the stock was all sold out, or sufficient samples had already been taken of the brands found. They sampled 21,114 sacks, representing 12,305 tons of fertilizer. One ton was sampled to every five and one-seventh tons sold in the state.

### COMPARATIVE COST OF FERTILIZER CHEMICALS AND UNMIXED FERTILIZER PRODUCTS.

Both ammonium sulfate and sodium nitrate have shown a small but consistent decline in price during the year. Calcium nitrate declined \$1.87 per ton in January 1935 and since that date has shown a further decline of 38 cents per ton. Potassium nitrate has been selling at a steady price, but \$3.15 per ton lower than for 1934. This is consistent with the decline in price of nearly all potash fertilizers. Most of the organic ammoniates have shown an advance in price during the year as compared with the six months' average for 1934; the September 1935 quotations for these products, however, show a consistent decline in price as compared with the six months' average ending March 1, 1935.

Superphosphate showed a small increase in cost for the six months' average as compared with the average price for the corresponding period in 1934; a decline of 25 cents per ton is noted, however, in the quotations for September 1935.

The decline in the price of potash salts noted in the fall of 1934 has held through the season of 1935.

The results of this brief review of the market would not indicate justification for an advance in the price of mixed fertilizers for 1936.

The following table gives average quotations taken from the Oil, Paint and Drug Reporter.

## Wholesale Quotations on Chemicals and Unmixed Materials.

NATURE OF MATERIAL.	AVERAGE PRICE PER TON FOR SIX MONTHS PRECEDING MARCH 1.		Price Per Ton Sept. 23, 1935.	Difference Between Sept. 23 Price and Six Months' Average: Sept. 1, 1934— Mar. 1, 1935.
	1934.	1935.		
Ammonium sulfate (20.5% N), 200 lb. bags, northern ports	\$26.48	\$25.80	\$22.00a	-\$3.80
Nitrate of soda (15.5% N), bags, natural or synthetic, ex vessel	26.44	25.50	24.80	-.70
Nitrate of lime (15% N), bags, northern ports, ex vessel	25.72	25.88	24.25	-1.63
Nitrate of potash (13% N, 44% K <sub>2</sub> O), bags, c.i.f. ports	53.65	48.15	45.00	-3.15
Urea (46% N), car lots, bags, ex vessel	104.72	110.00	100.00	-10.00
Dried blood (12.34% N), ground, bulk, New York	39.18	44.94	44.00	-.94
Hoof meal (14.15% N), f.o.b. Chicago	32.08	44.53	35.38	-9.15
Animal tankage (8.23% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), ground, bulk, New York	26.35	28.59	29.00	+.41
Dry ground fish (9.02% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), bags, Baltimore	40.92	39.56	37.00	-2.56
Cottonseed meal (5.75% N), bags, at mill	21.29	33.38	20.00	-13.13
Castor pomace (4.52% N), bags, car lots, f.o.b. works	17.12	18.45	16.50	-1.95
Ground bone (2.47% N, 22.88% P <sub>2</sub> O <sub>5</sub> ), bags, f.o.b. Chicago	21.73	16.96	19.00	+2.04
Superphosphate (16% avail. P <sub>2</sub> O <sub>5</sub> ), bulk, f.o.b. Baltimore	7.92	8.50	8.25	-.25
Muriate of potash (50.54% K <sub>2</sub> O), bags, c.i.f.	37.15	22.00	23.38	+1.38
High grade sulfate of potash (48.65% K <sub>2</sub> O), bags, c.i.f.	42.15	35.00	33.75	-1.25
Potash-magnesia sulfate (25.94% K <sub>2</sub> O), bags	25.00	22.50	22.25	-.25
Cotton hull ashes (25% K <sub>2</sub> O), bulk, delivered, car lots	33.75	21.25	21.25	none

a Bulk.

## Fertilizer Trade Values.

FORM OF PLANT FOOD.	Value per Pound.	Unit Value.
Nitrogen.		
In ammonia salts	\$0.0735	\$1.47
In nitrates	.0975	1.95
Organic nitrogen in fish	.21	4.20
Organic nitrogen in blood, meat and hoof meal	.215	4.30
Organic nitrogen in fine <sup>1</sup> bone and tankage	.2325	4.65
Organic nitrogen in coarse <sup>1</sup> bone and tankage and in pulverized manures	.16	3.20
Organic nitrogen in mixed fertilizers	.19	3.80
Organic nitrogen in cottonseed meal, castor pomace, linseed meal, etc.	.285	5.70
Organic nitrogen in urea and calurea	.1225	2.45
Organic nitrogen in cyanamid	.085	1.70
Phosphoric Acid.		
Soluble in water and neutral citrate of ammonia (available)	.05	1.00
In precipitated bone	.05	1.00
In basic slag phosphate	.06	1.20
In fine <sup>1</sup> bone and tankage, and in fish	.04	.80
In coarse <sup>1</sup> bone and tankage	.035	.70
In pulverized manures, seed residues, and ashes	.035	.70
Insoluble in neutral citrate of ammonia in mixed fertilizers	.02	.40
Potash.		
As sulfate	.0425	.85
As muriate	.026	.52
As carbonate	.099	1.98
As nitrate	.0375	.75
In potash-magnesia sulfate	.0525	1.05
In cotton hull and wood ashes (soluble)	.057	1.14
In organic vegetable compounds, sheep manure, and insoluble in ashes	.0375	.75
Magnesium Oxide.		
Water soluble from Kieserite and Emjeo	.067	1.34

<sup>1</sup> Fine bone and tankage refers to particles which, as sampled, will pass through a sieve with circular openings 1/50 of an inch in diameter. Coarse bone and tankage refers to that portion which will not pass through the sieve.

The foregoing fertilizer trade values are based on average wholesale quotations of fertilizer chemicals and unmixed materials, as taken from trade journals for six months ending March 1, 1935, to which 20 per cent has been added for overhead. When appropriate, an additional allowance has also been made for bags, labor and transportation.

### FERTILIZER TONNAGE.

#### Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts.

	July 1, 1932, to July 1, 1933.	July 1, 1933, to July 1, 1934.	July 1, 1934, to July 1, 1935.
Mixed fertilizers	37,076	40,160	42,912
Fertilizer chemicals and materials unmixed	16,451	15,870	18,711
Pulverized natural manures	1,443	1,614	1,585
Totals	54,970	57,644	63,208

There were 5,564 tons more fertilizer sold in the state in 1935 than during the previous year. The tonnage of mixed fertilizer was 2,752 more, and that of the fertilizer chemicals and unmixed materials was 2,841 more than for 1934. Pulverized manures showed a decrease of 29 tons. Of the total tonnage sold, 67.9 per cent was mixed fertilizer, 29.6 per cent was unmixed materials, and 2.5 per cent was dried and pulverized natural manures.

### Plant Food Tonnage.

	Nitrogen.		Phosphoric Acid.		Potash.	
	1934.	1935.	1934.	1935.	1934.	1935.
Mixed fertilizers	2,028	2,231	3,438	3,775	2,745	3,048
Fertilizer chemicals and materials unmixed	1,144	1,308	1,344	1,670	484	585
Pulverized natural manures	33	33	24	25	44	44
Totals	3,205	3,572	4,806	5,470	3,273	3,677

There were 1,435 more tons of plant food sold in the state than during 1934, of which 367 tons were nitrogen, 664 tons available phosphoric acid, and 404 tons potash.

There were 12,719 tons of plant food sold, of which 28 per cent was nitrogen, 43 per cent available phosphoric acid, and 29 per cent potash. Mixed fertilizers furnished 71 per cent of the plant food, chemicals and unmixed materials 28 per cent, and pulverized manures 1 per cent.

The three plant food elements were furnished in the following proportions by the mixed fertilizers and the unmixed materials, including the pulverized manures: nitrogen, 62 per cent from mixed and 38 per cent from unmixed; phosphoric acid, 69 per cent from mixed and 31 per cent from unmixed; potash, 83 per cent from mixed and 17 per cent from unmixed.

The following tables present tonnage figures for one year, July 1, 1934, to July 1, 1935, for both mixed fertilizers and unmixed fertilizer materials. In case of the mixed fertilizers the grade represents the plant food guarantee of each fertilizer and is expressed in the order of nitrogen, available phosphoric acid, potash.



**Tonnage of Mixed Fertilizers.****COMPLETE FERTILIZERS.**

*14 Per Cent or More of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash.)*

Grade.	Tonnage.	Brands.	Grade.	Tonnage.	Brands.
5-8-7	14,111	31	8-16-20	72	-
4-8-4	7,491	28	2-8-10	62	-
4-8-7	3,921	23	6-6-4	59	-
4-8-10	2,131	16	4-6-10	58	-
7-6-6	1,980	12	2-12-4	54	-
3-10-4	1,107	8	10-3-3	53	-
4-8-8	1,048	-	8-6-6	52	-
4-12-4	939	-	10-6-4	52	-
5-8-10	879	9	4-8-5	51	-
6-3-6	851	7	5-9-8	47	-
8-16-14	673	10	7-13-11	45	-
4-10-4	668	-	2-10-2	41	-
8-16-16	627	6	3-8-4	34	-
3-10-6	588	-	4-16-20	32	-
6-3-7	395	-	3-7-6	31	-
6-8-6	382	-	8-12-20	31	-
5-10-10	344	-	10-6-6	30	-
5-6-4	289	-	6-11-10	29	-
5-10-5	242	-	5-5-15	28	-
5-10-4	229	-	7-3-7	28	-
8-5-8	214	-	8-8-8	28	-
8-24-8	179	-	6-8-2	25	-
6-6-5	151	-	5-7-3	22	-
5-8-12	130	-	5-8-6	19	-
7-5-3	121	-	5-9-2	14	-
5-5-5	116	-	12-6-4	14	-
8-6-2	110	-	4-16-4	13	-
12-4-4	109	-	5-8-5	12	-
5-4-15	109	-	5-10-7	12	-
12-16-12	106	-	10-16-20	12	-
7-12-10	104	-	5-8-16	10	-
9-6-6	102	-	Miscellaneous	85	25
6-7-4	100	-			
			Totals	41,701	272

*Less than 14 Per Cent of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash.)*

5-3-5	626	8	3-3-3	15	-
4-2-2	23	-	5-6-2	14	-
4-6-3	18	-	Miscellaneous	4	-
			Totals	700	15

**SUPERPHOSPHATE WITH POTASH.****AMMONIATED SUPERPHOSPHATE.**

0-14-6	14	-	Miscellaneous	11	-
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Of the 42,401 tons of complete fertilizer sold, 75 per cent was furnished by 7 grades and 123 brands. Double and multiple-strength grades totaled 1,987 tons and 26 brands, which was 538 tons more than during the previous year.

Of the mixed fertilizer sold, over 98 per cent contained 14 per cent or over of available plant food.

There were 70 tons less of low-analysis (less than 14 per cent available plant food) complete fertilizers sold than in 1934. The 5-3-5 grade, comprising 8 brands, furnished over 89 per cent of the tonnage of this class of goods.

In the following table are listed ten of the most popular grades of mixed fertilizer together with the tonnage of each sold in Massachusetts for the years 1934 and 1935.

1934.		1935.	
GRADE.	Tonnage.	GRADE.	Tonnage.
5-8-7 . . . . .	13,346	5-8-7 . . . . .	14,111
4-8-4 . . . . .	8,399	4-8-4 . . . . .	7,491
4-8-7 . . . . .	3,013	4-8-7 . . . . .	3,921
4-8-10 . . . . .	2,310	4-8-10 . . . . .	2,131
7-6-6 . . . . .	1,415	7-6-6 . . . . .	1,980
4-8-8 . . . . .	1,085	3-10-4 . . . . .	1,107
3-10-4 . . . . .	1,080	4-8-8 . . . . .	1,048
5-8-10 . . . . .	762	4-12-4 . . . . .	939
4-12-4 . . . . .	651	5-8-10 . . . . .	879
8-16-16 . . . . .	591	6-3-6 . . . . .	851

The following table shows how the tonnage sold in 1934 corresponds with the New England Standard Nine grades selected by the New England Agronomists in 1931.

NEW ENGLAND STANDARD NINE GRADES.	Tonnage.	Additional Tonnage from Grades Varying but 1% in One or More Plant Foods.	Total.
5-8-7 . . . . .	14,111	5,042 <sup>a</sup>	19,153
4-8-4 . . . . .	7,491 <sup>b</sup>	345	7,836
4-8-10 . . . . .	2,203 <sup>c</sup>	—	2,203
7-6-6 . . . . .	1,980	203	2,183
6-3-6 . . . . .	851 <sup>d</sup>	1,058	1,909
3-10-4 . . . . .	1,107	671	1,778
2-12-4 . . . . .	54	—	54
5-8-10 . . . . .	891 <sup>e</sup>	—	891
2-8-10 . . . . .	94 <sup>f</sup>	—	94
Totals . . . . .	28,782	7,319	36,101

<sup>a</sup> Including 673 tons of 8-16-14.

<sup>b</sup> Including 242 tons of 5-10-5 and 6 tons of 15-30-15.

<sup>c</sup> Including 72 tons of 8-16-20.

<sup>d</sup> Including 7 tons of 10-5-10 and 2 tons of 8-4-8.

<sup>e</sup> Including 12 tons of 10-16-20.

<sup>f</sup> Including 32 tons of 4-16-20.

Of the total tonnage of mixed fertilizer sold in Massachusetts, 67 per cent was from grades recommended by New England Agronomists to meet New England conditions, and 17 per cent additional tonnage was from grades varying but one per cent in one or more plant food elements from the grades thus recommended. Of the ten grades, including the multiple strength mixtures, that have the highest tonnage (36,278 tons), all but four were among the New England Standard Nine. These six grades showed a total tonnage of 28,891.

Over 18 per cent of the total tonnage of mixed fertilizer was from five grades not included in the New England Standard Nine. They are 4-8-7, 8-16-14, third largest tonnage sold; 4-8-8, 8-16-16, seventh largest; 4-12-4, 8-24-8, eighth largest; 4-10-4, eleventh largest; and 5-3-5, twelfth largest.

The tonnage of unmixed materials, as shown in the following table, was distributed as follows: nitrogen products, 42 per cent; phosphoric acid products, 31 per cent; potash products, 5 per cent; tankage, fish, bone, nitrate of potash, Ammo-Phos, and wood ashes, 18 per cent; and miscellaneous, 4 per cent. Pulverized animal manures are not included.

## Tonnage of Unmixed Fertilizing Materials.

MATERIAL.	Tonnage.	Brands.	MATERIAL.	Tonnage.	Brands.
Superphosphate . . .	5,679	17	Dry ground fish . . .	115	11
Nitrate of soda . . .	2,651	5	Nitrate of potash . . .	92	5
Ground bone . . .	2,401	29	Wood ashes . . .	90	—
Cyanamid . . .	1,591	—	Sulfate of potash . . .	84	8
Pulverized animal manures	1,585	31	Ammo-Phos . . .	79	—
Cottonseed meal . . .	1,538	7	Dried blood . . .	61	—
Sulfate of ammonia . . .	969	12	Cotton hull ashes . . .	61	—
Muriate of potash . . .	828	13	Synthetic urea . . .	24	—
Milorganite . . .	647	—	Double superphosphate . . .	23	—
Animal tankage . . .	519	11	Calcium nitrate . . .	23	—
Peat . . .	515	6	Sulfate of potash-magnesia	13	—
Basic slag phosphate . . .	150	—	Cottonseed-castor meal . . .	12	—
Cal-Nitro . . .	133	—	Linseed meal . . .	10	—
Nitrate of potash-soda . . .	130	—	Miscellaneous . . .	20	5
Stone Meal . . .	130	—			
Castor pomace . . .	123	8	Totals . . .	20,296	200

## MIXED FERTILIZERS.

## Deficiency Statistics for Mixed Fertilizers.

MANUFACTURER.	NUMBER OF BRANDS.		NUMBER OF TESTS OR DETERMINATIONS.				
	Analyzed.	Approximately Equal to Guarantee in Commercial Valuation.	Totals. (a)	Not Exceeding $\frac{1}{4}$ Per Cent Below Guarantee.	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee.	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee.	More than $\frac{3}{4}$ Per Cent Below Guarantee.
Acme Guano Co. . . . .	8	8	24	1	0	0	0
American Agricultural Chemical Co. . . . .	48	48	144	1	1	3	1
Apothecaries Hall Co. . . . .	12	12	35	0	0	0	0
Armour Fertilizer Works . . . . .	21	21	63	3	3	0	1
Barrie Laboratories, Inc. . . . .	1	1	3	0	0	0	0
F. A. Bartlett Tree Expert Co., Inc. . . . .	1	1	3	0	0	0	0
Belmont Gardens . . . . .	1	1	3	0	0	0	0
Berkshire Chemical Co. . . . .	15	15	45	1	1	0	1
Woodworth Bradley, Inc. . . . .	1	1	3	0	0	0	0
Joseph Breck & Sons Corp. . . . .	1	1	3	1	0	0	0
Clay & Son, Ltd. . . . .	1	1	3	0	0	0	0
Collins Seed Service Co. . . . .	3	3	9	0	0	2	1
Consolidated Rendering Co. . . . .	20	20	63	2	0	0	0
Davey Tree Expert Co. . . . .	1	1	3	0	0	0	0
Jacob Dold Packing Co. . . . .	1	1	3	0	0	0	0
Eastern State Farmers' Exchange . . . . .	16	16	61	4	1	0	0
Thomas W. Emerson Co. . . . .	1	1	3	0	0	0	0
Ferti-Lawn Co., Inc. . . . .	1	1	3	0	0	0	0
H. L. Frost & Higgins Co. . . . .	2	1	6	0	0	0	2
Goulard & Olena, Inc. . . . .	1	1	3	0	0	0	0
Thomas J. Grey Co. . . . .	1	1	3	0	0	1	0
Thomas Hersom & Co. . . . .	2	2	6	0	0	0	0
A. H. Hoffman, Inc. . . . .	1	1	3	1	0	0	0
International Agricultural Corp. . . . .	16	16	57	4	0	1	1
Lowell Fertilizer Co. . . . .	7	7	21	0	0	0	0
McClain Brothers Co. . . . .	1	0	3	0	0	1	2
Miller Fertilizer Co. . . . .	9	9	27	2	1	1	1
Old Deerfield Fertilizer Co., Inc. . . . .	18	18	54	0	0	0	0
Olds & Whipple, Inc. . . . .	11	11	33	0	0	0	0
F. G. Phillips Co. . . . .	1	1	3	0	0	0	0
Plantabbs Corp. . . . .	1	1	3	0	0	0	0
Arthur B. Porter, Inc. . . . .	1	1	3	0	0	1	0
Rogers & Hubbard Co. . . . .	21	21	63	0	2	1	1
F. S. Royster Guano Co. . . . .	4	4	12	1	0	0	0
Salem Chemical & Supply Co. . . . .	1	1	3	1	1	0	0
O. M. Scott & Sons Co. . . . .	1	1	3	1	0	0	0
M. L. Shoemaker & Co., Inc. . . . .	1	1	2	0	0	0	0
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	16	15	48	2	0	0	2
Stimulant Laboratories, Inc. . . . .	1	1	3	0	0	0	0
Sutton & Sons, Ltd. . . . .	1	1	3	0	0	0	1
Swift & Co. . . . .	3	3	9	0	0	0	0
F. Sylvester & Son . . . . .	1	1	3	0	0	0	0
Synthetic Nitrogen Products Corp. . . . .	1	1	3	0	0	1	0
Tennessee Corp. . . . .	2	2	6	0	0	0	0
Van Horne Chemical Co., Inc. . . . .	1	1	3	0	0	0	0
Victory Fertilizer Corp. . . . .	3	3	9	0	0	0	0
Virginia-Carolina Chemical Corp. . . . .	2	2	6	0	0	0	0
C. P. Washburn Co. . . . .	3	3	9	1	0	0	0
Winslow Nurseries . . . . .	1	1	3	0	0	0	0
Totals . . . . .	288	285	887	26	10	12	14

a Several analyses of the same brand have been averaged and recorded in the table as one analysis. Analyses of fertilizer left over from previous year not included.

## Summary of Deficiencies in Mixed Fertilizers.

	1933.	1934.	1935.
Brands deficient in one element . . . . .	86	67	42
Brands deficient in two elements . . . . .	6	7	7
Brands deficient in three elements . . . . .	1	0	2
Brands deficient in nitrogen . . . . .	16	22	20
Brands deficient in available phosphoric acid . . . . .	41	22	22
Brands deficient in potash . . . . .	44	37	17
Brands deficient in magnesium oxide . . . . .	—	0	3

## Serious Commercial Shortages in Mixed Fertilizers.

AMOUNT OF SHORTAGE PER TON.	NUMBER OF BRANDS ACCORDING TO YEARS.			
	1932.	1933.	1934.	1935.
More than \$5 . . . . .	none	1	1	1
Between \$4 and \$5 . . . . .	none	none	none	none
Between \$3 and \$4 . . . . .	2	none	none	1
Between \$2 and \$3 . . . . .	none	2	none	none
Between \$1 and \$2 . . . . .	2	1	1	2

Of the 288 brands analyzed, 237, or 82 per cent, showed no deficiencies. Out of 887 plant food guarantees made, 93 per cent were fully maintained.

The deficiency table shows the following statistics:

Deficiencies not exceeding  $\frac{1}{4}$  of one per cent, 26.

Deficiencies between  $\frac{1}{4}$  and  $\frac{1}{2}$  of one per cent, 10.

Deficiencies between  $\frac{1}{2}$  and  $\frac{3}{4}$  of one per cent, 12.

Deficiencies more than  $\frac{3}{4}$  of one per cent, 14.

Of the total number of guarantees of each element made, 7 per cent of the nitrogen, 8 per cent of the available phosphoric acid, and 6 per cent of the potash were not met. Ten of the 20 nitrogen deficiencies, 5 of the 22 available phosphoric acid deficiencies, and 9 of the 17 potash deficiencies did not exceed one fourth of one per cent.

Compared with the 1934 inspection, there were 2 less shortages in nitrogen, the same number in available phosphoric acid, and 20 less in potash.

In the case of those fertilizers which did not conform strictly to the guarantee, the discrepancies were of such a character as to make it evident that there was no intentional attempt at violation of the regulations.

Mixing Efficiency Table.

MANUFACTURER.	AVERAGE PERCENTAGE OF PLANT FOOD ABOVE OR BELOW THE MINIMUM GUARANTEE.		
	Nitrogen.	Available Phosphoric Acid.	Potash.
Acme Guano Co.	+ .30	+ .57	+1.04
American Agricultural Chemical Co.	+ .16	+ .33	+ .22
Apothecaries Hall Co.	+ .42	+1.54	+ .74
Armour Fertilizer Works	+ .20	+ .36	+ .26
Berkshire Chemical Co.	+ .24	+ .62	+ .40
Consolidated Rendering Co.	+ .25	+ .36	+ .26
Eastern States Farmers' Exchange	+ .41	+ .33	+ .50
International Agricultural Corp.	+ .10	+ .20	+ .08
Lowell Fertilizer Co.	+ .17	+ .25	+ .24
Miller Fertilizer Co.	+ .33	+ .70	+ .23
Old Deerfield Fertilizer Co., Inc.	+ .32	+1.27	+ .32
Olds & Whipple, Inc.	+ .36	+ .66	+ .66
Rogers & Hubbard Co.	+ .39	+ .47	+ .30
Standard Wholesale Phosphate & Acid Works, Inc.	+ .23	+ .67	+ .40

Fourteen different firms have registered five or more brands of mixed fertilizers. On the basis of composition found by analysis as well as upon tonnage sold, the above table shows to what extent each manufacturer was successful in avoiding deficiencies in plant food guarantees in his mixtures. All of the fourteen firms provided a satisfactory average over-run in the three major plant food elements guaranteed.

#### Fertilizer Costs Compared.

The approximate money value of several fertilizers may be compared by dividing the average selling price of each grade by the average commercial valuation as found or as guaranteed, assuming in the latter case that the plant food guarantees are maintained. This will give the actual cost of one dollar of valuation. (The valuations are obtained by multiplying the percentage or units of the several forms of nitrogen, available phosphoric acid, and potash as given in the tables of analysis by the unit value as published in the table of trade values; the sum of all these items will be the commercial valuation of the fertilizer.)

#### Acid and Basic Fertilizers.

The following table shows the extent to which the mixed fertilizers sold in the state during the year contributed to soil acidity.

These results were secured by the use of the Pierre method modified to correct for the equivalent basicity of the citrate insoluble phosphoric acid found in each fertilizer (see page 101, Vol. XVII, No. 1, Journal of the Association of Official Agricultural Chemists).

Both basic and acidic results have been computed on the basis of the total tonnage of the various brands sold in the state and are given in terms of tons of carbonate of lime. The net acidity is obtained by deducting the total basicity of the brands that were alkaline from the total acidity of the brands that were acid, the results being expressed in terms of calcium carbonate. Data for each manufacturer's brands are on file and will be furnished to the appropriate manufacturer upon application.

## Summary of Data on Acid and Basic Fertilizers.

FERTILIZER TONNAGE TESTED			EXTENT OF ACIDITY OR BASICITY ON FERTILIZER TONNAGE SOLD, RESULTS EXPRESSED IN TONS OF CALCIUM CARBONATE ( $\text{CaCO}_3$ ).		
	1934.	1935.		1934.	1935.
Acid . . .	35,205	35,715	Acidity . . . . .	4,812	3,840
Basic . . .	4,523	6,967	Basicity . . . . .	149	445
Total . . .	39,728	42,682	Net acidity . . . . .	4,663	3,395

With an increase over 1934 of 2,954 tons of mixed fertilizer inspected, the net acidity, expressed in tons of carbonate of lime, is 1,268 tons less than for 1934. This shows a more liberal use of fine ground limestone as a conditioner in mixed fertilizers.

## Explanation of Tables of Analyses.

**Guarantee.** The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer, Brand and Grade," and is expressed as nitrogen, available phosphoric acid and water soluble potash and in that order.

**Commercial Shortages.** In the table designated "Mixtures showing a commercial shortage of \$1 or more per ton," the column headed "Approximate commercial valuation per ton" gives the sum of the valuation of each plant food element computed from the analysis by use of the trade values adopted by the Massachusetts Fertilizer Control for 1935, which appear on a preceding page of the bulletin.

Under the heading "Approximate commercial shortage per ton" is shown the commercial valuation of the deficiencies or tests found below the guarantee after allowance is made for the value of overruns or tests above the guarantee.

Deficiencies are emphasized by boldface type.

**Mixtures Substantially Complying with the Guarantee.** In addition to the analysis of those fertilizers substantially complying with the guarantee, this table includes also those mixtures that are more or less out of balance; that is, having deficiencies in one or more plant food elements, but having overruns which largely offset the value of the deficiencies.

"Number of samples" indicates the number of samples included in the composite which was analyzed.

**Inferior Nitrogen.** The presence of inferior forms of organic nitrogen is indicated by footnotes.

**Potash Forms.** Wherever tests for chlorine showed a sufficient amount present to unite with all of the potash found, the source of the potash is designated as muriate. Wherever insufficient chlorine was found to account for all of the potash it is evident that forms of potash other than muriate were used. In such cases, the figures under the sub-heading "As muriate" do not imply necessarily that muriate of potash was actually added to the mixture, but that chlorine was present, probably from impurities in the fertilizer chemicals, in amounts to account for the percentage of potash indicated. The balance of the potash found is listed under the sub-heading "In forms other than muriate" and may be derived from sulfate, nitrate, or carbonate, as the case may be.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton.

NAME OF MANUFACTURER AND BRAND.	Where Sampled.	Approximate Commercial Valuation Per Ton.	Approximate Commercial Shortage Per Ton.	NITROGEN FOUND.				PHOSPHORIC ACID.		POTASH (K <sub>2</sub> O) FOUND.	
				In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.	Avail-able.	Total.	As Muriate	In Forms Other than Muriate.
<b>H. L. Frost &amp; Higgins Co.</b> Frost's Shade Tree Special 10-6-6 (composite of 2 samples) <sup>(a)</sup>	{ Arlington { W. Manchester	\$27.86	\$1.90	6.04	none	2.07	8.11	7.08	8.80	6.43	-
<b>International Agricultural Corp.</b> International 8-16-14 (6)	Haverhill Framingham Center	38.15	1.61	6.30	.77	.53	7.60	15.81	16.23	12.81	1.03
International 8-16-14 (6)		37.17	1.91	6.38	1.10	.24	7.72	15.42	15.87	12.81	.68
<b>McClain Brothers Co.</b> Veg-E-Tonic 21-13-10	West Newton	65.32	3.71	12.18	.02	8.30	20.50	11.86	11.86	7.15	.31
<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b> Standard United States 8-16-16	Amesbury	38.45	5.15	3.64	none	2.47	6.11	14.15	14.48	18.14	-

<sup>a</sup> This fertilizer was manufactured by the Walker Fertilizer Co., Inc., Orlando, Florida. It is the custom in Florida to designate fertilizer grade in terms of ammonia, available phosphoric acid and water soluble potash. Through an oversight this lot was made up to test 10 per cent ammonia, instead of 10 per cent nitrogen. The same explanation holds true with reference to Frost's Lawn and Shrubbery Special 8-0-2 listed under 'Mixtures substantially complying with guarantee.'

<sup>b</sup> Water soluble magnesium oxide guaranteed, 2%; found in 1 sample, 1.39%; found in 1 sample, 1.41%. One other sample showed a commercial shortage of 82 cents: a composite of 4 other samples substantially complied with the guarantee.



## Mixtures Substantially Complying with Guarantees.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Acme Guano Co.								
1	Acme 2-8-2 . . . . .	1.52	.04	.59	2.15	9.31	8.71	-
1	Acme 2-10-2 . . . . .	1.94	none	.48	2.42	9.93	2.51	.34
1	Acme 4-6-10 . . . . .	3.58	.09	.59	4.26	7.75	10.47	-
3	Acme 4-8-4 . . . . .	3.46	.17	.99	4.62	8.80	4.07	.50
2	Acme 5-8-7 . . . . .	4.28	.13	.75	5.16	8.65	7.17	-
1	Acme 5-8-10 . . . . .	4.34	.08	.60	5.02	9.09	10.02	-
2	Sergeant's 4-8-4 . . . . .	3.32	.20	.69	4.21	9.09	4.53	-
4	Sergeant's 4-8-7 . . . . .	3.48	none	.70	4.18	8.67	7.27	.44
1	Sergeant's 4-8-7 . . . . .	3.24	.64	.90	4.78	8.01	6.65	2.85
American Agricultural Chemical Co.								
1	AA 4-8-8 Fertilizer . . . . .	2.86	.81	.76	4.43	8.06	8.16	-
1	AA 8-16-16 Fertilizer . . . . .	2.00	1.42	4.83	8.25	15.80	18.41	-
5	AA Complete Manure with 10% Potash 4-8-10 . . . . .	2.80	.64	.67	4.11	8.14	10.17	-
5	AA Corn Favorite 3-10-4 . . . . .	2.20	.46	.92	3.58	10.62	4.24	-
5	AA Corn Favorite 3-10-4 . . . . .	2.12	.17	1.01	3.30	10.08	4.19	-
1	AA Country Club Fertilizer 7-5-2 . . . . .	3.16	.30	3.93	7.39	6.89	2.46	-
6	AA Cranberry Fertilizer 5-6-4 . . . . .	4.14	.49	.37	5.00	6.12	4.03	-

## INSPECTION OF COMMERCIAL FERTILIZERS

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2	AA Double Strength 8-16-14	.	.	.	.	.	.	.80	.38	8.10	16.61	13.49	-
4	AA Double Strength Fertilizer with 20% Potash 8-16-20	.	.	.	.	.	.	1.09	.30	8.09	15.63	21.05	-
1	AA General Crop Fertilizer 2-10-2	.	.	.	.	.	.	.16	.60	2.34	10.05	3.10	-
4	AA Monarch Fertilizer 4-8-4	.	.	.	.	.	.	.33	.88	4.07	8.04	4.11	-
5	AA Monarch Fertilizer 4-8-4	.	.	.	.	.	.	.61	.83	4.28	8.34	4.13	-
4	AA Peerless Fertilizer 4-8-7	.	.	.	.	.	.	.24	.80	4.16	8.49	7.17	-
6	AA Potato Grower 5-8-10	.	.	.	.	.	.	.91	.90	5.25	8.12	10.02	-
4	AA Potato & Vegetable Fertilizer 5-8-7	.	.	.	.	.	.	.56	.57	5.07	8.41	7.15	-
9	AA Potato & Vegetable Fertilizer 5-8-7	.	.	.	.	.	.	.74	.73	5.03	8.34	7.25	-
3	AA Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	.04	.62	2.30	8.47	10.35	-
3	AA Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	none	.64	2.22	8.04	10.17	-
1	AA Tobacco Starter 5-5-15	.	.	.	.	.	.	.65	1.90	5.09	5.79	2.18a	11.80
4	AA Top Dresser 7-6-6	.	.	.	.	.	.	1.37	3.57	6.98	6.26	6.34	-
8	AA Top Dresser 7-6-6	.	.	.	.	.	.	1.18	.88	7.36	6.63	6.16	-
7	Agrico for Aroostook with 10% Potash 5-8-10	.	.	.	.	.	.	.71	.91	5.06	8.09	10.48	-
4	Agrico for Aroostook with 10% Potash 5-8-10	.	.	.	.	.	.	.85	1.03	5.16	8.57	10.14	-
4	Agrico for Corn 3-10-6	.	.	.	.	.	.	none	.81	3.11	10.64	6.22	-
9	Agrico for Corn 3-10-6	.	.	.	.	.	.	none	.85	3.03	10.25	6.30	-
4	Agrico for Fruit 9-6-6	.	.	.	.	.	.	.93	.45	9.08	6.25	6.01	-
4	Agrico for Fruit 9-6-6	.	.	.	.	.	.	.43	1.09	9.28	6.25	6.45	-
4	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	.76	.91	7.15	6.51	6.03	-
5	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	.86	.80	7.12	6.37	6.12	-
4	Agrico for New England 4-8-10	.	.	.	.	.	.	.63	.78	4.21	8.10	10.17	-
8	Agrico for New England 4-8-10	.	.	.	.	.	.	.26	.86	4.04	8.09	10.17	-
4	Agrico for Pastures and Top Dressing 7-6-6	.	.	.	.	.	.	.73	1.14	7.15	6.35	6.57	-
2	Agrico for Potatoes Double Strength 8-16-14	.	.	.	.	.	.	.79	.47	8.20	15.46	14.67	-
3	Agrico for Potatoes Double Strength 8-16-20	.	.	.	.	.	.	.91	.29	8.00	15.40	20.02	-

a The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total		As Muriate.	In Forms Other than Muriate.
American Agricultural Chemical Co.—Concluded.								
4	Agrico for Potatoes and Vegetables 5-8-7	3.46	.95	1.04	5.45	8.42	7.34	—
5	Agrico for Potatoes and Vegetables 5-8-7	3.62	.84	.67	5.13	8.54	7.31	—
6	Agrico for Potatoes and Vegetables 5-8-7	3.88	.67	.65	5.20	8.36	7.07	—
4	Agrico for Tobacco 6-3-6	1.46	.54	4.24	6.24	3.22	—	6.55
2	Agrico for Tobacco 6-3-6	1.64	.61	3.91	6.16	3.34	—	6.86
5	Agrico for Truck 5-10-5	3.60	.72	.85	5.17	10.31	5.50	—
4	Bowler's All Round Fertilizer 3-10-4	2.34	.46	.84	3.64	10.87	4.30	—
6	Bowler's All Round Fertilizer 3-10-4	2.28	none	.92	3.20	10.46	4.17	—
5	Bowler's Market Garden Fertilizer 4-8-4	2.58	.54	1.19	4.31	8.47	4.26	—
4	Bowler's Market Garden Fertilizer 4-8-4	2.88	.32	1.11	4.31	8.22	4.05	—
4	Bowler's Stockbridge Early Crop Manure 5-8-7	3.68	.65	.89	5.22	8.02	7.05	—
4	Bowler's Stockbridge Early Crop Manure 5-8-7	3.82	.32	1.03	5.17	8.04	7.04	—
4	Bowler's Stockbridge Potato and Vegetable Manure 4-8-10	2.64	.31	1.27	4.22	8.55	10.16	—
5	Bowler's Stockbridge Potato and Vegetable Manure 4-8-10	2.88	.43	.91	4.22	8.11	10.52	—
3	Bowler's Stockbridge Truck Manure 4-8-7	3.12	.13	.83	4.08	8.12	7.17	—
4	Bradley's Blood, Bone and Potash Brand 5-8-7	3.98	.52	.72	5.22	8.74	7.58	—
5	Bradley's Blood, Bone and Potash Brand 5-8-7	3.68	.33	1.14	5.15	8.16	7.04	—
4	Bradley's Complete Manure with 10% Potash 4-8-10	2.94	.32	.86	4.12	8.03	10.16	—
4	Bradley's Complete Manure with 10% Potash 4-8-10	2.82	.40	1.00	4.22	8.42	10.37	—
4	Bradley's Complete Manure for Potatoes and Vegetables 4-8-7	3.14	.51	.88	4.53	8.20	7.31	—
3	Bradley's Complete Manure for Potatoes and Vegetables 4-8-7	2.94	.12	1.01	4.07	8.19	7.05	—

4	Bradley's Northland Fertilizer 4-8-4 .	2.80	.51	.73	4.04	8.06	4.03	-
4	Bradley's Northland Fertilizer 4-8-4 .	2.80	.32	.93	4.05	8.29	4.05	-
4	Bradley's XL Fertilizer 3-10-4 .	2.14	.23	.97	3.34	10.09	4.26	-
6	Bradley's XL Fertilizer 3-10-4 .	2.20	none	.96	3.16	10.59	4.15	-
3	Co-op 4-8-4 Fertilizer .	2.66	.30	1.09	4.05	8.16	4.55	-
2	Co-op 4-8-7 Fertilizer .	3.06	.17	.84	4.07	8.02	7.21	-
4	Co-op 5-8-7 Fertilizer .	4.00	.45	.95	5.40	8.80	7.04	-
1	Co-op 5-8-7 Fertilizer .	3.98	.55	.74	5.27	8.16	7.19	-
4	Co-op 7-6-6 Fertilizer .	5.44	.98	.69	7.11	6.07	6.10	-
5	Co-op 8-16-14 Fertilizer .	6.78	1.04	.26	8.08	16.33	14.11	-
2	Double A Tobacco Fertilizer 5-3-5 .	1.56	.46	3.15	5.17	3.57	-	5.41
1	National Market Garden Fertilizer 3-8-4 .	2.98	.44	.61	4.03	8.24	4.46	-
1	National Pine Tree Brand 4-8-4 .	3.06	.70	.56	4.32	8.04	4.05	-
3	Netco Greens Formula 8-0-2 .	4.02	.24	4.53	8.79	6.37	2.13	-
3	Netco Greens Formula 8-6-2 .	5.08	.47	2.91	8.46	6.00	1.97	.24
2	Sanderson's Formula A 4-8-4 .	2.70	.46	.88	4.04	8.16	4.17	-
2	Sanderson's Formula B 4-8-7 .	2.24	.56	1.34	4.14	8.34	-	7.15
<b>American Soda Products Co.</b>								
2	Grogreen Fern Food 3-8-3 (a) .	2.44	.79	1.51	4.74	9.49	1.07	1.49
<b>Apothecaries Hall Co.</b>								
3	Liberty Corn 2-10-2 .	1.46	.33	.97	2.76	10.49	3.10	-
1	Liberty High Grade Corn 2-12-4 .	1.36	.05	1.22	2.63	12.87	4.81	-
1	Liberty High Grade Market Gardeners 5-8-7 .	2.24	2.20	1.06	5.50	10.69	7.21	-
4	Liberty High Grade Market Gardeners 5-8-7 .	2.26	1.77	1.50	5.53	9.92	7.31	-
1	Liberty High Grade Tobacco Manure 6-3-7 .	.16	2.01	4.40	6.57	5.30	-	7.79
3	Liberty Market Gardeners Special 4-8-4 .	2.64	.62	1.00	4.26	9.09	4.92	-
3	Liberty Onion Special (Potash as Sulphate) 4-8-7 .	1.90	1.36	1.14	4.40	9.86	-	7.54

<sup>a</sup> Registration excused. All stocks recalled.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Apothecaries Hall Co.—Concluded.								
3	Liberty Potato and General Crops 4-8-10	2.60	.89	.96	4.45	8.73	11.86	—
1	Liberty Potato and Market Gardeners (Potash as Muriate) 4-8-7	2.84	.73	.99	4.56	9.01	7.33	—
1	Liberty Special Fertilizer for Fruit 7-8-6	2.66	3.82	.88	7.36	8.49	6.26	—
2	Liberty Special Fertilizer for Lawns, Gardens, etc., 4-4-0	none	.18	4.50	4.68	9.08	—	—
3	Liberty Tobacco Special 5-3-5	.10	1.74	3.33	5.17	5.18	—	6.32
2	Liberty Top Dresser for Grass and Grain 8-8-8	5.80	2.37	.58	8.75	8.47	9.55	—
Armour Fertilizer Works								
1	Armours Big Crop Fertilizer 2-8-10	1.38	.23	.61	2.22	7.71	10.41	—
1	Armours Big Crop Fertilizer 2-10-2	1.60	.06	.54	2.20	12.12	4.11	—
1	Armours Big Crop Fertilizer 2-12-4	1.64	.03	.52	2.19	12.25	4.05	—
2	Armours Big Crop Fertilizer 3-10-4	2.06	.62	.56	3.24	10.08	4.32	—
1	Armours Big Crop Fertilizer 4-6-10	2.34	1.40	.44	4.18	6.45	11.84	—
5	Armours Big Crop Fertilizer 4-8-4	2.84	.73	.79	4.36	8.66	4.17	—
5	Armours Big Crop Fertilizer 4-8-4	2.88	.77	.53	4.18	8.34	4.01	—
2	Armours Big Crop Fertilizer 4-8-4	3.04	.17	1.01	4.22	8.52	4.28	—
3	Armours Big Crop Fertilizer 4-8-7	2.54	.76	.79	4.09	8.47	7.67	—
2	Armours Big Crop Fertilizer 4-8-8	2.80	.68	.62	4.10	8.04	8.18	—
5	Armours Big Crop Fertilizer 4-8-10	2.00	1.38	.76	4.14	8.42	9.86	—
5	Armours Big Crop Fertilizer 4-16-4	3.44	.60	.28	4.32	16.02	4.26	—
1	Armours Big Crop Fertilizer 4-16-4	3.38	.60	.13	4.11	16.08	4.01	—

4	Armours Big Crop Fertilizer 5-8-7	.	.	.	.	3.24	.95	1.05	5.24	8.05	7.42	-
7	Armours Big Crop Fertilizer 5-8-7	.	.	.	.	3.06	.99	1.09	5.14	8.09	7.15	-
2	Armours Big Crop Fertilizer 5-8-10	.	.	.	.	2.80	1.43	.66	4.89	8.67	11.29	-
1	Armours Big Crop Fertilizer 6-11-10	.	.	.	.	4.58	1.25	.33	6.16	11.99	9.37	.42
4	Armours Big Crop Fertilizer 7-6-6	.	.	.	.	5.80	.96	.33	7.09	6.20	6.40	-
3	Armours Big Crop Fertilizer 8-16-14	.	.	.	.	6.16	1.37	.17	7.70	16.84	13.47	.19
1	Armours Big Crop Fertilizer 8-16-16	.	.	.	.	7.26	.64	.48	8.38	16.48	17.64	-
1	Armours Big Crop Tobacco Special 5-3-5	.	.	.	.	.28	2.59	2.56	5.43	3.98	-	5.22
1	Armours Big Crop Tobacco Special 6-3-6	.	.	.	.	.42	2.47	3.62	6.51	3.72	-	6.61
1	Armours Big Crop Tobacco Starter 5-5-15	.	.	.	.	.18	4.30	.74	5.22	5.95	-	15.72
3	Armours Special Turf Fertilizer 10-8-6	.	.	.	.	8.32	.49	.39	9.20	8.88	5.83	.37
1	Armours Vert Plant Food 5-8-6	.	.	.	.	3.98	.84	.24	5.06	8.68	6.65	-
<b>Barrie Laboratories, Inc.</b>												
1	Barrie's Plant Food 6-4-6	.	.	.	.	.22	1.17	6.21	7.60	8.24	4.40	2.15
<b>F. A. Bartlett Tree Expert Co.</b>												
1	Bartlett Green Tree Food 6-7-4	.	.	.	.	4.86	.25	1.40	6.51	7.42	4.42	-

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.			Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		MAGNESIUM OXIDE.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.		Total.	As Muriate.	In Forms Other than Muriate.	Found.	Guaranteed.
Belmont Gardens										
1	Belgard Plant Food 6-15-4	5.08	.40	.94	6.42	16.70	-	5.00		
Berkshire Chemical Co.										
1	Berkshire Complete Fertilizer 2-12-2	1.04	.41	.95	2.40	12.73	2.29	-		
1	Berkshire 4-8-10 Fertilizer	2.50	.82	1.24	4.56	8.62	10.14	-		
1	Berkshire Complete Tobacco Fertilizer 5-3-5	.16	1.90	3.43	5.49	3.93	-	6.51		
1	Berkshire Double Strength Fertilizer 8-16-14	6.30	1.99	.54	8.83	14.21	15.48	-		
1	Berkshire Economical Grass Fertilizer 8-8-8	3.24	4.11	1.15	8.50	8.04	7.23	1.57	.94a	-
4	Berkshire Grass Special Fertilizer 6-6-5	4.86	.19	1.03	6.08	7.15	5.66	-		
2	Berkshire High Grade Tobacco Fertilizer 6-3-6	.22	1.52	4.24	5.98	4.25	-	6.12		
1	Berkshire Long Island Special Fertilizer 4-8-7	2.20	.67	1.22	4.09	8.37	7.31	-	2.07b	2.00b
1	Berkshire Long Island Special Fertilizer 4-8-7	2.38	.80	1.20	4.38	8.28	7.60	-	2.17b	2.00b
4	Berkshire Long Island Special Fertilizer 4-8-7	1.94	.32	1.98	4.24	8.54	7.38	-	1.22b	2.00b
1	Berkshire Market Garden Fertilizer 4-8-4	2.26	.71	1.29	4.26	8.57	4.26	-		
4	Berkshire Market Garden Fertilizer 4-8-4	2.26	.63	1.35	4.24	8.61	4.28	-		
1	Berkshire Market Garden Fertilizer 4-8-4	2.18	.73	1.20	4.11	7.60	4.54	-		
1	Berkshire Onion Special Fertilizer 4-10-4	2.24	.54	1.43	4.21	10.66	4.51	-		
1	Berkshire Onion Special Fertilizer 4-10-4	1.88	1.44	.99	4.31	10.98	-	4.17		
1	Berkshire Onion Special Fertilizer 4-10-4	2.16	.80	1.09	4.05	10.97	4.38	-		
1	Berkshire Potato and Garden Special Fertilizer 5-8-7	3.28	.65	1.50	5.43	8.37	7.79	-		

4	Berkshire Potato and Garden Special Fertilizer 5-8-7	3.26	1.16	1.02	5.44	8.20	7.40	-
1	Berkshire Potato and Garden Special Fertilizer 5-8-7	3.06	.87	1.14	5.07	8.45	7.21	-
2	Berkshire Potato and Garden Special Fertilizer, with Sulphate Potash 5-8-7	2.50	1.76	.99	5.25	9.10	-	6.98
1	Berkshire Potato and Garden Special Fertilizer, with Sulphate Potash 5-8-7	1.80	2.68	.93	5.41	9.27	1.68c	4.36
1	Berkshire Tobacco Special 7-3-7	.24	2.85	4.16	7.25	4.37	-	8.35
3	Berkshire Tobacco Starter Fertilizer 5-5-15	.18	3.29	1.65	5.12	6.11	-	15.72
2	Berkshire Truck Fertilizer 4-8-5	2.30	.98	1.16	4.44	8.17	5.10	-
<b>Woodworth Bradley, Inc.</b>								
1	Golco 8-6-4	5.88	1.47	.98	8.33	6.00	4.03	-
<b>Joseph Breck &amp; Sons Corp.</b>								
2	Breck's Special Market Garden Manure 5-10-10	1.48	1.86	1.62	4.96	10.51	3.61	6.39
<b>Clay &amp; Son, Ltd.</b>								
2	Clay's Fertilizer 5-9-2	2.54	.46	2.68	5.68	10.72	-	2.69
<b>Collins Seed Service Co.</b>								
2	Casto-Poma Grass Manure 5-6-2	2.10	1.26	1.99	5.35	5.49	2.46	-
2	Complete Grass Manure 6-8-1	2.66	1.31	2.21	6.18	7.37	1.40	-
1	Ver-Best Putting Green Manure 7-8-2	2.80	1.67	2.70	7.17	7.10	2.25	-
<b>Consolidated Rendering Co.</b>								
4	Corenco 3-10-4 Animal Brand	1.38	1.60	.99	3.97	10.20	4.36	-
6	Corenco 3-10-4 Animal Brand	1.24	.89	1.03	3.16	10.54	4.17	-
4	Corenco 4-8-4 Corn and Vegetable	2.26	1.21	.87	4.34	8.11	4.40	-
4	Corenco 4-8-4 Corn and Vegetable	2.06	1.25	1.21	4.52	8.98	4.98	-
5	Corenco 4-8-4 Corn and Vegetable	2.10	1.13	.91	4.14	8.29	4.15	-

<sup>a</sup> Water soluble magnesium oxide .72%.

<sup>b</sup> Water soluble MgO guaranteed, none; found, .81%, .94% and .10%.

<sup>c</sup> The presence of small amounts of chlorine may be due to impurities in the fertilizer chemicals and not to the direct use of muriate of potash.



## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		MAGNESIUM OXIDE.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	Found.	Guaranteed.	
Consolidated Rendering Co.—Concluded.											
3	Corenco 4-8-7 Market Garden . . . .	2.10	.28	1.80	4.18	8.94	7.21	—			
2	Corenco 4-8-7 Market Garden . . . .	2.38	.95	.85	4.18	8.24	7.07	—			
4	Corenco 4-8-10 Potato Grower . . . .	2.18	.96	1.12	4.26	8.50	10.41	—			
10	Corenco 4-8-10 Potato Grower . . . .	2.14	1.22	.90	4.26	8.03	10.16	—			
3	Corenco 4-8-10 Made with Water Soluble Magnesium . . . .	2.04	.93	1.15	4.12	8.29	10.06	—	1.36a	1.00a	
1	Corenco 4-12-4 Complete Manure . . . .	2.00	1.05	1.41	4.46	12.50	4.92	—			
3	Corenco 5-5-5 Lawn and Shrub Fertilizer . . . .	2.04	.82	2.19	5.05	6.20	—	6.76			
7	Corenco 5-8-7 General Crop Manure . . . .	2.98	1.30	1.01	5.29	8.36	6.94	—			
4	Corenco 5-8-7 General Crop Manure . . . .	3.18	1.19	.90	5.27	8.38	7.29	—			
5	Corenco 5-8-7 General Crop Manure . . . .	3.12	1.13	.91	5.16	8.03	7.07	—			
3	Corenco 5-8-7 Made with Water Soluble Magnesium . . . .	3.10	1.13	1.02	5.25	8.49	7.34	—	1.01a	1.00a	
1	Corenco 5-8-7 Made with Water Soluble Magnesium . . . .	3.06	1.32	.99	5.37	8.04	7.23	—	1.36a	1.00a	
4	Corenco 5-8-10 Peerless Potato . . . .	3.04	1.15	1.01	5.20	8.21	11.16	—			
6	Corenco 5-8-10 Peerless Potato . . . .	2.94	1.02	1.07	5.03	8.47	10.02	—			
4	Corenco 5-9-8 . . . .	2.64	1.14	1.38	5.16	9.02	8.84	—			
2	Corenco 5-9-8 Made with Water Soluble Magnesium . . . .	2.98	1.21	.96	5.15	9.51	8.20	—	1.16a	1.00a	
1	Corenco 6-3-6 Special Tobacco Grower . . . .	.64	1.10	4.49	6.23	4.52	—	6.28			

	Corenco 7-3-7 Super Tobacco Grower . . .	2.26	1.19	3.74	7.19	4.33	-	7.07
2	Corenco 7-6-6 Complete Fruit and Top Dressing . . .	5.06	1.14	1.11	7.31	6.15	6.67	-
4	Corenco 7-6-6 Complete Fruit and Top Dressing . . .	5.00	1.11	.93	7.04	6.58	6.16	-
5	Corenco 7-13-11 "It Cuts the Cost" . . .	5.02	.79	1.03	6.84	13.45	10.85	-
3	Corenco 7-13-16 . . .	3.72	1.92	1.37	7.01	13.96	16.22	-
1	Corenco 8-6-4 Top Dressing . . .	5.94	1.42	.86	8.22	6.71	4.13	-
4	Corenco 8-16-14 Two in One . . .	4.46	2.27	1.38	8.11	15.62	16.24	-
2	Corenco 8-16-14 Two in One . . .	4.31	2.44	1.30	8.08	16.28	14.11	-
5	New England 8-6-2 Putting Green Special . . .	5.24	.19	2.86	8.29	6.86	2.51	.13
2	New England 8-6-2 Putting Green Special . . .	5.28	.31	2.75	8.34	6.99	2.62	-
3	Davey Tree Expert Co.							
2	Davey Tree Food 10-3-3 . . .	6.50	1.98	2.02	10.50	3.29	2.55	.74
	Jacob Dold Packing Co.							
1	Dold Special 5-12-6 Fertilizer . . .	6.08	.77	.60	7.45	12.71	6.78	-
	Eastern States Farmers' Exchange							
4	E. S. 0-14-6 . . .	-	-	-	-	15.13	6.14	3.71
6	E. S. 4-8-8 . . .	3.06	.70	.65	4.41	8.62	8.39	.80
5	E. S. 4-8-8 . . .	3.20	.76	.53	4.49	8.16	8.62	.80
6	E. S. 4-12-4 . . .	2.72	1.24	.35	4.31	12.63	4.36	.80
3	E. S. 4-12-4 . . .	2.72	1.23	.50	4.45	12.00	4.63	.80
4	E. S. 4-16-20 . . .	2.94	1.19	.35	4.48	15.82	18.77	1.60
1	E. S. 4-16-20 . . .	2.88	.68	.59	4.15	15.69	18.98	1.60
1	E. S. 5-5-15 . . .	.22	2.28	2.98	5.48	6.14	-	2.39 <sup>a</sup>
3	E. S. 6-3-6 Cranberry . . .	.16	6.20	.44	6.80	6.05	-	7.36

<sup>a</sup> Water soluble.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		MAGNESIUM OXIDE.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	Found.	Guaranteed.	
Eastern States Farmers' Exchange—Con.											
6	E. S. 6-8-6 . . . . .	3.94	2.16	.45	6.55	8.39	6.49	—	3.33	.80	
3	E. S. 6-8-6 . . . . .	4.12	1.97	.34	6.43	8.27	6.51	—	3.55	.80	
2	E. S. 8-4-8 Tobacco . . . . .	.58	2.66	5.53	8.77	4.31	—	8.08	1.70	1.56	
4	E. S. 8-12-20 . . . . .	6.08	1.53	.65	8.26	12.40	16.76	3.26	1.90a	1.62a	
8	E. S. 8-16-16 . . . . .	6.10	1.43	.63	8.16	16.20	16.17	—	1.59a	1.60a	
5	E. S. 8-16-16 . . . . .	5.72	1.48	.50	7.70	16.40	16.55	—	1.67a	1.60a	
2	E. S. 8-16-16 (Low Chlorine Special) . . . . .	6.12	1.52	.63	8.27	16.15	—	16.73	1.81a	1.60a	
3	E. S. 8-20-12 . . . . .	5.94	1.66	.53	8.13	20.03	12.04	—	1.49a	1.60a	
6	E. S. 8-24-8 . . . . .	5.30	1.94	1.23	8.47	24.49	—	8.64	2.14	1.60	
6	E. S. 8-24-8 . . . . .	5.30	3.01	.59	8.90	22.71	—	10.31	2.25	1.60	
2	E. S. 10-5-10 Tobacco . . . . .	4.10	2.94	3.73	10.77	5.33	—	10.17	1.90	1.70	
7	E. S. 12-4-4 . . . . .	7.78	4.47	.35	12.60	4.21	4.38	—	—	—	
4	E. S. 12-16-12 . . . . .	8.28	3.75	.65	12.68	16.83	—	12.07	2.25	1.60	
4	E. S. 12-16-12 . . . . .	7.36	4.32	.72	12.40	16.38	—	12.29	1.87	1.60	
Thomas W. Emerson Co.											
3	Emerson's "English Formula" Lawn and Gar- den Dressing 5-7-3 . . . . .	3.18	.10	2.29	5.57	11.23	2.22	.84	—	—	
3	Emerson's "English Formula" Lawn and Gar- den Dressing 5-7-3 . . . . .	3.12	none	2.49	5.61	11.15	3.55	—	—	—	

Ferti-Lawn Co., Inc.													
1	Ferti-Lawn 4-7-3	.	.	.	.	.	3.88	none	1.32	5.20	11.48	4.54	-
H. L. Frost & Higgins Co.													
2	Frost's Lawn and Shrubbery Special 8-6-3	.	.	.	.	.	1.36	.10	5.31	6.77	6.63	3.28	-
Goulard & Olena, Inc.													
1	G & O Plant Food 12-15-20 (1934 stock)	.	.	.	.	.	9.88	.41	1.49	11.78	17.96	16.34	-
1	G & O Commercial Fertilizer 5-8-7	.	.	.	.	.	2.98	.88	1.51	5.37	8.54	7.71	-
Thomas J. Grey Co.													
1	Grey's Plant Food 9-6-6	.	.	.	.	.	7.92	1.17	.58	9.67	6.79	5.48	-
Thomas Hersom & Co.													
3	Neverfail 4-8-4	.	.	.	.	.	2.06	1.28	1.01	4.35	8.29	4.26	-
5	Neverfail 5-8-7	.	.	.	.	.	3.26	1.19	.98	5.43	8.62	7.05	-
A. H. Hoffman, Inc.													
1	Hoffman's Plant Food 5-8-6	.	.	.	.	.	2.18	1.81	1.60	5.59	11.20	-	5.91
International Agricultural Corp.													
1	International 3-8-4	.	.	.	.	.	2.24	.55	.44	3.23	8.09	4.01	-
5	International 3-10-4	.	.	.	.	.	1.78	.66	.60	3.04	10.08	4.28	-
4	International 3-10-4	.	.	.	.	.	2.24	.60	.42	3.26	10.39	4.38	-
4	International 4-8-4	.	.	.	.	.	2.80	1.07	.57	4.44	8.35	4.13	-
4	International 4-8-4	.	.	.	.	.	2.62	.81	.58	4.01	8.29	4.01	-
2	International 4-8-7	.	.	.	.	.	2.74	.98	.80	4.52	8.42	6.86	.48
2	International 4-8-7	.	.	.	.	.	2.82	.49	.80	4.11	8.03	7.03	-
4	International 4-8-8	.	.	.	.	.	2.86	.71	.54	4.11	8.03	7.98	-
													1.23
													1.00
													1.29

a Water soluble.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		MAGNESIUM OXIDE.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	Found.	Guaranteed.	
International Agricultural Corp.—Concluded											
2	International 4-8-10 . . . . .	2.64	.80	.63	4.07	8.08	10.45	—	1.30	1.00	
2	International 4-8-10 . . . . .	2.84	.77	.68	4.29	8.34	10.17	—	2.79	1.00	
6	International 4-8-10 . . . . .	3.04	.55	.44	4.03	8.34	10.23	—	2.01	1.00	
8	International 5-8-7 . . . . .	3.58	.98	.57	5.13	8.24	7.05	—			
4	International 5-8-7 . . . . .	3.50	1.00	.66	5.16	8.42	7.07	—			
5	International 7-6-6 . . . . .	5.14	1.04	.99	7.17	6.37	6.26	—			
3	International 7-6-6 . . . . .	5.42	.95	.74	7.11	6.48	6.12	—			
4	International 8-16-14 (a) . . . . .	6.08	1.41	.68	8.17	15.71	11.58	2.82	1.37b	2.00b	
1	International 8-16-14 (a) . . . . .	6.38	.78	.54	7.70	16.66	12.81	.66	1.47b	2.00b	
2	International 8-16-16 . . . . .	6.30	1.03	.46	7.79	15.20	17.29	.75			
1	International 8-16-20—2% MgO . . . . .	6.40	.99	.72	8.11	16.32	16.76	3.69	3.11	2.00	
3	International Caribbee Green & Fairway 7-5-3	3.04	1.60	2.53	7.17	5.35	1.48	1.58	2.03	2.00	
4	International Caribbee Green & Fairway 7-5-3	2.90	1.73	2.51	7.14	5.18	1.85	1.19	3.42	2.00	
1	International Caribbee Market Garden Fer- tilizer 5-10-10 . . . . .	1.64	1.82	1.84	5.30	10.91	3.70	6.65	2.90b	2.00b	
3	International Caribbee Market Garden Fer- tilizer 5-10-10 . . . . .	1.50	1.91	1.89	5.30	10.55	3.29	7.25	1.88b	2.00b	
1	International Caribbee Market Garden Fer- tilizer 5-10-10 . . . . .	1.70	2.01	1.58	5.29	10.61	2.83	7.67	2.10b	2.00b	
6	International Caribbee Market Garden Fer- tilizer 5-10-10 . . . . .	1.60	2.08	1.69	5.37	10.95	3.74	6.28	1.92b	2.00b	
2	International Caribbee Market Garden 7-12-10	2.54	2.33	2.18	7.05	12.30	1.89	8.90	1.88b	2.00b	
2	International Caribbee Market Garden 7-12-10	2.38	2.34	2.35	7.07	12.24	2.30	8.26	2.26b	2.00b	
1	International Caribbee Market Garden 7-12-10	2.72	2.24	2.24	7.20	12.76	7.60	2.46	1.96b	2.00b	

1	International Caribbee Market Garden 10-16-20	3.42	4.19	2.29	9.90	15.50	8.58	12.38	2.396	2.006
1	International Caribbee Market Garden 10-16-20	3.78	4.28	2.31	10.37	16.20	8.71	11.99	2.396	2.006
1	International Caribbee Tobacco Starter 5-8-16 —2% MgO	.82	3.08	1.71	5.61	9.86	3.12	13.30	4.18	2.00
<b>Little Tree Farms</b>										
1	Plant Food 5-8-5 for House Plants (1934 stock)	4.26	.10	2.06	6.42	11.39	5.76	—	—	—
1	Plant Food 5-8-5 for Vegetable Garden (1934 stock)	4.56	.18	1.58	6.32	15.58	5.82	—	—	—
1	Plant Food 5-8-5 for Evergreens (1934 stock)	2.20	2.15	1.56	5.91	11.14	5.79	—	—	—
1	Plant Food 5-8-5 for Azaleas and Rhododendrons, with Aluminum Sulfate (1934 stock) (c)	2.30	none	1.37	3.67	16.47	.98	1.97	—	—
<b>Lowell Fertilizer Co.</b>										
3	Lowell 3-10-4 Animal Brand A High Grade Manure for All Crops	1.12	.90	1.04	3.06	10.56	4.09	—	—	—
2	Lowell 3-10-4 Animal Brand A High Grade Manure for All Crops	1.40	.116	.71	3.27	10.84	4.26	—	—	—
5	Lowell 4-8-4 Corn and Vegetable	2.10	.94	1.18	4.22	8.07	4.26	—	—	—
3	Lowell 4-8-4 Corn and Vegetable	2.24	1.13	.96	4.33	8.16	4.17	—	—	—
1	Lowell 4-8-7 Old General Crop Manure for Potatoes and Market Garden Crops	2.30	1.21	.87	4.38	8.30	7.21	—	—	—
4	Lowell 4-8-10 Potato Grower	2.06	1.29	.96	4.31	8.31	10.43	—	—	—
4	Lowell 4-8-10 Potato Grower	2.24	1.03	.93	4.20	8.29	10.74	—	—	—
4	Lowell 5-8-7 Market Garden Manure	2.94	1.07	.99	5.00	8.35	7.42	—	—	—
6	Lowell 5-8-7 Market Garden Manure	3.10	1.07	.99	5.16	8.03	7.04	—	—	—

<sup>a</sup> Two other samples were deficient; see analyses in table of "Mixtures showing a commercial shortage of \$1 or more per ton."

<sup>b</sup> Water soluble.

<sup>c</sup> No aluminum sulfate found.

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Lowell Fertilizer Co.—Concluded.								
2	Lowell 5-8-10 Aroostook Special for Potatoes . . . . .	3.08	.86	1.14	5.08	8.20	10.14	—
4	Lowell 7-6-6 Complete Fruit and Top Dressing . . . . .	4.94	1.33	1.09	7.36	6.54	6.41	—
2	Lowell 7-6-6 Complete Fruit and Top Dressing . . . . .	5.00	1.07	.93	7.00	6.96	6.14	—
Miller Fertilizer Co.								
1	Miller Harvest Brand 3-8-4 . . . . .	2.12	.19	.81	3.12	8.22	4.55	—
1	Miller Harvest Brand 3-10-4 . . . . .	2.10	.05	1.11	3.26	10.23	4.74	—
1	Miller Harvest Brand 4-6-10 . . . . .	2.84	.31	.70 <sub>a</sub>	3.85	6.35	10.79	—
3	Miller Harvest Brand 4-8-4 . . . . .	2.74	.67	.82	4.23	8.49	4.30	—
2	Miller Harvest Brand 4-8-7 . . . . .	3.12	.28	.72 <sub>a</sub>	4.12	8.65	7.17	—
2	Miller Harvest Brand 4-8-10 . . . . .	2.70	.28	1.11 <sub>a</sub>	4.09	8.29	10.08	—
4	Miller Harvest Brand 5-8-7 . . . . .	3.78	.12	1.02	4.92	8.98	7.19	—
2	Miller Harvest Brand 5-8-7 . . . . .	3.24	.60	.87	4.71	8.80	7.19	—
1	Miller Harvest Brand 7-6-6 . . . . .	4.50	.62	.75	5.87	7.07	6.16	—
2	Miller Harvest Brand 8-6-6 . . . . .	5.40	1.11	.98	7.49	7.61	5.56	—
Old Deerfield Fertilizer Co., Inc.								
1	Old Deerfield 8-16-14 . . . . .	3.34	1.01	4.14	8.49	16.79	14.50	—
2	Old Deerfield Complete Tobacco 5-3-5 . . . . .	.40	.77	4.16	5.33	3.94	—	5.25

2	Old Deerfield Complete Tobacco 6-3-7	.32	1.11	4.92	6.35	4.91	-	7.44
2	Old Deerfield Complete Tobacco 6-3-7	.82	.26	5.27	6.35	4.39	-	7.71
3	Old Deerfield Corn and Seeding Down 3-10-6	.92	.81	1.47	3.20	11.24	6.22	-
1	Old Deerfield General Crop 4-8-4	1.18	.99	2.02	4.19	9.96	-	4.11
1	Old Deerfield General Crop 4-8-4	1.10	.49	2.46	4.05	9.68	4.32	-
3	Old Deerfield Grass Top Dressing 7-6-6	3.32	3.45	.81	7.58	6.96	5.01	1.42
2	Old Deerfield Grass Top Dressing 7-6-6	3.36	3.19	.58	7.13	6.94	6.07	-
2	Old Deerfield High Potash 4-8-10	1.16	.97	2.01	4.14	9.39	10.74	-
1	Old Deerfield Lawnshrub 5-5-5	1.30	.71	3.48	5.49	7.54	5.74	-
2	Old Deerfield Potato 4-8-7	1.24	.93	1.98	4.15	9.86	7.13	-
1	Old Deerfield Potato 4-8-7	1.24	.41	2.39	4.04	9.45	7.05	-
3	Old Deerfield Potato (potash other than muriate) 4-8-7	1.38	.96	1.94	4.28	9.73	-	7.42
3	Old Deerfield Set Onion (potash other than muriate) 5-8-7	1.26	1.09	2.93	5.28	9.70	-	7.89
2	Old Deerfield Set Onion 5-8-7	1.66	1.07	2.67	5.40	9.49	7.15	-
5	Old Deerfield Starter Bone and Potash 5-8-12	.24	1.93	3.74	5.91	8.75	-	12.56
3	Valley Brand 4-8-4	1.96	1.22	.93	4.11	8.47	4.52	-
3	Valley Brand 4-8-7	1.92	1.63	.74	4.29	8.80	7.05	-
1	Valley Brand 4-8-10	1.96	1.42	.80	4.18	8.85	10.21	-
1	Valley Brand 5-8-7	2.24	1.94	1.40	5.58	8.44	7.07	-
1	Valley Brand 8-16-14	3.74	4.30	.34	8.38	16.15	14.54	-
<b>Olds &amp; Whipple, Inc.</b>								
5	"Luxura" 5-8-6	2.50	.61	2.57	5.68	10.71	5.34	1.04
1	"Luxura" 5-8-6 (1934 stock)	2.50	.80	2.38	5.68	11.41	6.84	-
1	O & W Blue Label Tobacco Fertilizer 6-3-6	.26	1.46	4.70	6.42	3.63	-	6.22
2	O & W Complete Tobacco Fertilizer 5-3-5	.10	.25	4.95	5.30	3.41	-	5.60

<sup>a</sup> The water insoluble nitrogen was of inferior quality.



## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Olds & Whipple, Inc.—Concluded.								
2	O & W High Grade Potato and Vegetable Fertilizer 5-8-7 .	3.12	1.11	1.17	5.40	8.14	-	7.56
1	O & W High Grade Potato and Vegetable—Extra Organic and Sulfate 5-8-7 . . . . .	2.60	1.27	1.73	5.60	8.88	-	8.15
3	O & W High Grade Tobacco Starter and Potash Compound 5-4-15 . . . . .	1.04	1.74	2.47	5.25	5.72	-	16.05
2	O & W Market Garden Fertilizer 4-8-4 . . . . .	2.46	.81	1.07	4.34	8.42	4.57	-
1	O & W Market Garden Fertilizer 4-8-4 . . . . .	2.38	1.00	1.07	4.45	8.29	-	4.48
5	O & W Market Garden Fertilizer 4-8-4 . . . . .	2.52	.95	1.01	4.48	8.37	4.30	-
1	O & W Market Garden Fertilizer 4-8-4 . . . . .	2.56	.76	.93	4.25	8.44	-	6.07
1	O & W Potato and General Purpose Fertilizer 4-8-7 . . . . .	1.06	1.11	2.02	4.19	8.29	7.46	-
2	O & W 8-6-6 Top Dressing and Grass Fertilizer . . . . .	3.60	3.86	.72	8.18	6.94	6.38	-
1	Wilcox 4-8-4 Market Garden Fertilizer . . . . .	2.42	.78	1.20	4.40	8.29	4.36	-
2	Wilcox 5-8-7 . . . . .	3.04	.90	1.29	5.23	8.27	7.69	-
F. G. Phillips Co.								
3	Ferti-Flora 3-3-3 . . . . .	1.30	1.97	.36	3.63	3.44	3.88	-
Plantabbs Corp.								
4	Fulton's Plantabbs 11-15-20 . . . . .	4.86	6.78	.16	11.80	18.98	-	23.26
Arthur B. Porter, Inc.								
4	Porter's Special Golf Course 8-6-2 . . . . .	2.74	1.47	3.28	7.49	7.52	3.29	-

## INSPECTION OF COMMERCIAL FERTILIZERS

[illegible]

## Mixtures Substantially Complying with Guarantees — Continued.

Number of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphate Acid Found.	POTASH (K <sub>2</sub> O) FOUND	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Rogers & Hubbard Co.—Concluded.								
4	Red H Truckers' Special Cropper 4-8-7	3.20	.19	1.14	4.53	8.37	7.17	—
3	Red H Truckers' Special Cropper 4-8-7	3.50	none	.68	4.18	8.65	6.16	.89
5	Red H 4-8-10	3.36	.36	.62	4.34	8.55	10.08	—
6	Red H Potato Cropper 5-8-7	4.06	.17	1.23	5.46	8.26	7.27	—
6	Red H Potato Cropper 5-8-7	4.62	.13	.63	5.38	8.24	7.05	—
2	Red H 5-8-10	4.36	.25	.72	5.33	8.32	10.25	—
6	Red H Grass Cropper 7-6-6	4.80	.70	2.30	7.80	6.61	6.09	—
4	Red H Grass Cropper 7-6-6	5.32	1.30	1.24	7.86	6.00	6.38	—
3	Red H Hi-Grade Cropper 8-16-14	6.84	.44	.95	8.23	14.80	14.65	—
F. S. Royster Guano Co.								
2	Royster Connecticut Tobacco Guano 5-3-5	.26	.96	4.46	5.68	3.06	—	5.29
1	Royster Quality Trucker 4-8-7	3.08	.18	.95	4.21	8.55	8.56	—
1	Royster 5% Truck Guano 5-8-7	4.22	.23	1.04	5.49	8.16	6.86	—
4	Royster Truckers Delight 4-8-4	3.44	.22	.84	4.50	8.16	4.57	—
Salem Chemical & Supply Co.								
3	Plant Food 3-4-3	2.46	.55	none	3.01	3.60	2.85	—
O. M. Scott & Sons Co.								
1	Scott's 10-6-4 Turf Builder	5.96	1.10	3.05	10.11	5.99	3.57	.73

M. L. Shoemaker & Co.									
2	Shoemaker's "Swift Sure" Tobacco Starter 4-10-0	.	.	.	3.16	.37	.74	4.27	11.80
<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b>									
2	Bell Brand 4-8-4	.	.	.	3.00	.25	1.12	4.37	8.29
2	Bell Brand 4-8-4	.	.	.	3.60	.19	.51	4.30	8.72
2	Bell Brand 5-8-7	.	.	.	3.82	none	1.22	5.04	8.34
1	Bell Brand 5-8-7	.	.	.	4.06	.32	.96	5.34	8.62
1	Pinkerton Bell Brand 2-10-2	.	.	.	1.26	none	.83	2.09	12.50
1	Pinkerton Bell Brand 4-8-4	.	.	.	3.46	.30	.72	4.48	8.80
2	Pinkerton Bell Brand 5-8-7	.	.	.	4.02	.14	1.10	5.26	8.34
1	Pinkerton Bell Brand 8-6-6	.	.	.	7.00	.90	1.12	9.02	7.18
1	Standard U. S. 4-8-4	.	.	.	2.80	.38	1.08	4.26	8.47
2	Standard U. S. 4-8-7	.	.	.	3.14	.12	1.10	4.36	8.44
1	Standard U. S. 4-8-7	.	.	.	3.22	.14	.90	4.26	8.93
2	Standard U. S. 4-8-8	.	.	.	3.78	.32	.78	4.88	8.29
1	Standard U. S. 4-8-8	.	.	.	3.40	.11	1.02	4.53	8.41
2	Standard U. S. 5-8-7	.	.	.	4.00	.17	1.14	5.31	8.68
1	Standard United States 5-8-10	.	.	.	4.14	.35	.93	5.42	8.35
2	Standard United States 6-3-7 with Sulphate of Potash	.	.	.	4.94	none	1.26a	6.20	4.40
3	Standard United States 8-6-6	.	.	.	6.66	none	1.11	7.77	7.71
1	Standard United States 8-6-6	.	.	.	6.74	.73	1.14	8.61	6.50
1	Standard United States Fish Brand 4-8-4	.	.	.	2.82	.09	1.18	4.09	9.75
2	Standard United States Fish Brand 5-8-7	.	.	.	3.72	.29	.99	5.00	8.98
<b>Stimulant Laboratories, Inc.</b>									
1	Stimulant 11-12-15 Tablets	.	.	.	2.24	8.88	none	11.12	13.80

a The water insoluble nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Concluded.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
<b>Sutton &amp; Sons, Ltd.</b>								
1	Sutton's Simplex Fertiliser 5-9-2 . . . . .	2.26	.48	2.28	5.02	6.10	-	3.10
<b>Swift &amp; Company Fertilizer Works</b>								
1	Swift's Red Steer Brand 4-8-7 (a) . . . . .	2.60	.28	1.28	4.16	8.08	7.33	-
1	Swift's Special Golf Fertilizer 12-6-4 . . . . .	11.88	.42	.16	12.46	6.00	4.61	-
6	Vigoro 4-12-4 . . . . .	3.40	.47	.25	4.12	12.37	4.86	-
4	Vigoro 4-12-4 . . . . .	3.40	.76	.20	4.36	12.75	4.77	-
<b>F. Sylvester &amp; Son</b>								
2	Dove Brand Fertilizer 4-6-3 . . . . .	2.60	.17	1.53	4.30	7.19	3.64	-
<b>Synthetic Nitrogen Products Corp.</b>								
1	Nitrophoska 15-30-15 . . . . .	12.08	2.49	.51	15.08	29.72	15.08	-
2	Nitrophoska 15-30-15 . . . . .	12.32	2.13	.61	15.06	29.08	15.02	-
<b>Tennessee Corp.</b>								
6	Loma (5-10-4) . . . . .	4.22	.62	.65	5.49	10.33	4.03	-
3	Loma (5-10-4) . . . . .	4.16	.98	.65	5.79	10.59	4.17	-
4	Soil-Prep (4-2-2) . . . . .	1.98	.12	1.98b	4.08	2.04	2.07	-
2	Soil-Prep (4-2-2) . . . . .	1.82	.35	2.17b	4.34	2.09	2.11	-
<b>Wm. Thomson &amp; Sons, Ltd.</b>								
1	Thomson's Vine Plant & Vegetable Manure 3-7-4 (old stock)	1.76	none	1.75	3.51	11.37	-	7.79

Van Horne Chemical Co., Inc.										
2	Van Horne's Lawn and Garden Grower 5-8-5	.	.	.	2.48	1.32	1.78	5.58	9.24	5.48
1	Van Horne's Lawn and Garden Grower 5-8-5	.	.	.	3.04	.45	1.55	5.04	9.46	5.56
Victory Fertilizer Corp.										
3	Victory Lawn and Garden Fertilizer 4-8-4	.	.	.	2.42	1.41	.96	4.79	8.88	4.11
1	Victory Lawn and Garden Fertilizer 3.29-8-4 (old stock)	.	.	.	3.80	.34	1.29	5.43	10.36	4.36
3	Victory Putting Green Fertilizer 6-8-2	.	.	.	4.25	.96	1.35	6.56	8.72	2.17
1	Victory Putting Green Fertilizer 7-9-2	.	.	.	4.02	1.46	1.60	7.08	9.39	2.15
Virginia-Carolina Chemical Corp.										
2	BloomAid (New Process) 4-10-3	.	.	.	2.42	.43	1.72	4.57	12.56	3.12
1	BloomAid 4.94-10-4 (old stock)	.	.	.	2.94	.75	1.39	5.08	11.36	1.48
5	V-C Fairway Fertilizer (New Process) 6-6-4	.	.	.	3.84	.34	2.38b	6.56	7.13	3.04
5	V-C Fairway Fertilizer (New Process) 6-6-4	.	.	.	3.74	.80	1.95b	6.49	6.76	2.83
C. P. Washburn Co.										
4	"Made Right" Corn and Vegetable 4-8-4	.	.	.	2.84	.65	.97	4.46	8.11	4.32
3	"Made Right" Market Garden 5-8-7	.	.	.	4.04	.33	1.03	5.40	8.67	7.73
2	"Made Right" Special Potato 4-8-10	.	.	.	2.82	.55	1.04	4.41	8.24	9.90
C. E. Wilson & Co.										
1	Seal Kraft Plant Food 2-4-9 (c)	.	.	.	.32	.06	2.97	3.35	12.28	-
Winslow Nurseries										
1	Green Valley Plant Food 5-10-7	.	.	.	1.30	1.68	2.77	5.75	12.32	7.44

<sup>a</sup> Trucked from Albany, N. Y., for own use.

<sup>b</sup> The water insoluble nitrogen was of inferior quality.

<sup>c</sup> This fertilizer was not for sale. It was given away with each package containing twelve rose bushes purchased. Handled by S. S. Kresge Co. stores.

## CHEMICALS AND RAW PRODUCTS.

## Summary of Results of the Inspection of Fertilizer Samples and Raw Products.

MATERIAL.	Number of Samples Collected.	Number of Analyses Made.	Average Percentage of Nitrogen	Average Percentage of Total Phosphoric Acid.	Average Percentage of Available Phosphoric Acid.	Average Percentage of Water Soluble Potash.	Average Selling Price Per Ton.	Average Commercial Valuation per Ton.	Cost of One Pound of Plant Food (Cents).
Nitrate of soda . . .	50	9	16.18	-	-	-	\$34.78	\$31.55	10.75 (nitrogen)
Nitrate of potash . . .	7	4	13.08	-	-	44.46	75.92	58.87	4.25 (potash)
Nitrate of lime . . .	4	1	14.70	-	-	-	36.19	28.67	14.6 (nitrogen)
Cal-Nitro . . .	8	2	20.58	-	-	-	39.50	35.19	12.3 (nitrogen)
Nitrate of soda-potash . . .	4	2	14.62	-	-	15.41	38.11	40.07	9.6 (nitrogen)
Ammonium sulfate . . .	62	22	20.80	-	-	-	37.40	30.58	4.25 (potash)
Synthetic urea . . .	4	3	46.10	-	-	-	115.56	112.95	8.55 (nitrogen)
Cyanamid . . .	10	9	21.84 <sup>a</sup>	-	-	-	34.72	37.13	9.0 (nitrogen)
Ammo-Phos A . . .	7	3	11.45	49.60	48.68	-	63.47	65.88	12.53 (nitrogen)
									7.95 (nitrogen)
									7.35 (nitrogen)
									4.79 (available phosphoric acid)
Ammo-Phos B . . .	1	1	16.50	22.85	21.54	-	-	-	-
Cottonseed meal . . .	58	58	6.69	2.82 <sup>b</sup>	-	1.89 <sup>c</sup>	41.73	38.13	31.19 (nitrogen)
Castor pomace . . .	10	10	5.46	1.95 <sup>b</sup>	-	1.10 <sup>c</sup>	31.41	31.12	28.76 (nitrogen)
Linseed meal . . .	2	2	5.15	2.36 <sup>b</sup>	-	1.78 <sup>c</sup>	-	29.36	-
Dried blood . . .	6	4	11.83	2.35	-	-	52.31	52.75	21.3 (nitrogen)
Milorganite . . .	9	2	6.09	2.80	-	-	38.09	30.56	29.43 (nitrogen)
Superphosphate 16% . . .	104	30	-	17.01	16.41	-	19.22	16.65	5.85 (available phosphoric acid)
Double superphosphate . . .	3	1	-	33.30	32.92	-	35.40	33.07	5.38 (available phosphoric acid)
Basic slag phosphate . . .	6	2	-	18.39	16.28	-	23.80	17.12	7.3 (available phosphoric acid)
Precipitated bone . . .	3	3	-	40.23	39.42	-	47.37	39.74	6.01 (available phosphoric acid)
Muriate of potash . . .	60	24	-	-	-	59.67	34.61	31.03	2.9 (potash)
High grade sulfate of potash . . .	18	12	-	-	-	49.19 <sup>d</sup>	54.51	41.81	5.54 (potash)
Potash-magnesia sulfate . . .	3	3	-	-	-	27.02 <sup>e</sup>	30.89	22.97	5.7 (potash)
Dry ground fish . . .	27	16	9.78	6.98 <sup>f</sup>	-	-	50.63	46.66	23.03 (nitrogen)
Animal tankage . . .	41	15	9.69	8.19 <sup>g</sup>	-	-	53.50	44.11	24.45 (nitrogen)
									3.75 (phosphoric acid)
Ground bone . . .	123	38	2.88	25.00 <sup>h</sup>	-	-	40.49	31.39	-
Ground tobacco stems . . .	1	1	2.38	38 <sup>i</sup>	-	3.86 <sup>c</sup>	-	10.79	-
Cotton hull ashes . . .	4	4	-	2.30 <sup>j</sup>	-	29.87	39.79	38.03	6.0 (potash)
Wood ashes . . .	5	5	-	1.96 <sup>k</sup>	-	5.56	-	12.81	-
Pulverized sheep manure (l) . . .	64	25	1.81	1.48	-	3.11 <sup>c</sup>	48.40	9.16	-
Pulverized sheep and goat manure (l) . . .	31	9	1.58	1.20	-	3.28 <sup>c</sup>	36.45	8.36	-
Pulverized cattle manure (l) . . .	25	10	2.11	1.49	-	2.18 <sup>c</sup>	46.56	9.43	-
Pulverized poultry manure (l) . . .	7	3	5.08	2.41	-	1.27 <sup>c</sup>	48.22	18.90	-
Pulverized poultry manure and peat (l) . . .	5	2	3.15	3.29	-	1.57 <sup>c</sup>	-	13.56	-
Sheep manure and wool waste (l) . . .	6	6	1.37	.48	-	4.03 <sup>c</sup>	15.00	7.74	-

<sup>a</sup> Also contains about 50% of calcium oxide in form to neutralize soil acidity.

<sup>b</sup> Cottonseed meal had average calcium oxide .99%, magnesium oxide 1.23%; castor pomace had calcium oxide, 1.52%, magnesium oxide 1.01%; linseed meal had calcium oxide 1.19%, magnesium oxide 1.17%.

<sup>c</sup> Total potash.

<sup>d</sup> Chlorine 2.11%.

<sup>e</sup> Magnesium oxide 9.55%, chlorine 2.15%.

<sup>f</sup> Chlorine .12%.

<sup>g</sup> Average tankage finer than 1/50 inch, 49.55%; coarser than 1/50 inch, 50.45%.

<sup>h</sup> Average bone finer than 1/50 inch, 70.04%; coarser than 1/50 inch, 29.96%.

<sup>i</sup> Organic matter 67.40%.

<sup>j</sup> Calcium oxide 12.12%, magnesium oxide 5.50%, moisture 5.37%, insoluble matter 12.47%.

<sup>k</sup> Average calcium oxide 33.92%, magnesium oxide 3.99%, water 6.95%, insoluble matter 11.45%.

<sup>l</sup> Average organic matter: sheep manure, 48.40%; sheep and goat manure, 37.16%; cattle manure, 66.43%; poultry manure, 64.27%; poultry manure and peat, 63%; sheep manure and wool waste, 32.39%.

## Nitrogen Compounds.

The chemicals and unmixed materials under this headings are valued chiefly for the nitrogen which they contain. Some of them, however, contain more than this one element; the nitrate of potash containing potash; the calcium nitrate and cyanamid containing lime; and the organic vegetable substances containing small quantities of phosphoric acid and potash, as will be noticed by a reference to the summary table on the previous page.

Brands showing a commercial shortage of one dollar or more per ton are listed by themselves, serious deficiencies being emphasized by boldface type.

## Nitrate of Soda and Sulfate of Ammonia.

MANUFACTURER.	NITRATE OF SODA.			SULFATE OF AMMONIA.		
	Number of Samples.	NITROGEN.		Number of Samples.	NITROGEN.	
		Found.	Guaranteed.		Found.	Guaranteed.
American Agricultural Chemical Co.	-	-	-	{ 3	20.78	20.56
	-	-	-	{ 1	20.90	20.56
	-	-	-	{ 1	20.80	20.56
	-	-	-	{ 4	20.80	20.56
	-	-	-	{ 3	20.96	20.56
Apothecaries Hall Co.	-	-	-	5	21.08	20.56
Armour Fertilizer Works	-	-	-	1	20.98	20.56
Barrett Co.	-	-	-	5a	20.86	20.56
	{ 19a	16.26	16.00	2a	20.82	20.56
	{ 6a	16.06	16.00	3	20.82	20.56
	{ 3a	16.20	16.00	1	20.62	20.56
	{ 1a	16.34	16.00	-	-	-
	{ 1a	16.08	16.00	-	-	-
Chilean Nitrate Sales Corp.	{ 6b	16.12	16.00	-	-	-
	{ 7b	16.04	16.00	-	-	-
	{ 1b	16.10	16.00	-	-	-
	{ 6c	15.96	15.25	-	-	-
Consolidated Rendering Co.	-	-	-	{ 5	20.72	20.56
	-	-	-	{ 5	20.62	20.50
Eastern States Farmers' Exchange	-	-	-	4	20.98	20.50
Ford Motor Co.	-	-	-	3	20.90	20.80
Goulard & Olena, Inc.	-	-	-	1	21.00	20.75
Hudson Valley Fuel Corp.	-	-	-	3	20.94	20.80
International Agricultural Corp.	-	-	-	{ 7	20.58	20.56
	-	-	-	{ 1	20.26	20.56
	-	-	-	{ 1	20.76	20.56
Old Deerfield Fertilizer Co.	-	-	-	1	20.10	20.50
Rogers & Hubbard Co.	-	-	-	2	20.70	20.50

a Arcadian brand.

b Champion brand

c Standard brand.

## Nitrate of Potash, Nitrate of Soda-Potash.

MANUFACTURER.	Number of Samples.	NITROGEN.		POTASSIUM OXIDE.		Chlorine.
		Found.	Guaranteed.	Found.	Guaranteed.	
Berkshire Chemical Co.	2	13.08	13.00	44.72	44.00	.22
Eastern States Farmers' Exchange	2	13.06	13.00	44.44	44.00	.20
International Agricultural Corp.	{ 2a	14.64	14.00	15.39	14.00	.56
	{ 2a	14.26	14.00	15.70	14.00	.50
	{ 1	13.54	13.00	44.76	44.00	.32
Old Deerfield Fertilizer Co., Inc.	2	13.22	13.00	44.84	44.00	.44

a Nitrate of soda-potash.



## Cottonseed Meal.

MANUFACTURER.	BRAND.	NITROGEN.	
		Found.	Guaranteed.
Ashcraft-Wilkinson Co. . . . .	(Cow-Eta Brand . . . . .	6.61	6.58
	Cow-Eta Brand . . . . .	6.99	6.56
	Cow-Eta Brand . . . . .	6.82	6.56
	Cow-Eta Brand . . . . .	6.65	6.56
	Cow-Eta Brand . . . . .	6.79	6.56
	Cow-Eta Brand (Japan) . . . . .	6.75	6.56
	Cow-Eta Brand . . . . .	6.57	6.56
	Cow-Eta Brand (American) . . . . .	6.71	6.56
	Cow-Eta Brand (Japan) . . . . .	6.86	6.56
	Cow-Eta Brand . . . . .	6.67	6.56
	Cow-Eta Brand . . . . .	6.69	6.56
	Cow-Eta Brand . . . . .	6.84	6.56
	Cow-Eta Brand . . . . .	6.52	6.56
	Paramount Brand . . . . .	5.98	5.76
	Paramount Brand . . . . .	5.90	5.76
	Paramount Brand . . . . .	6.12	5.76
	Paramount Brand . . . . .	5.83	5.76
Cairo Meal and Cake Co. . . . .	Cottonseed and Castor Meal . . . . .	6.21	5.75
	Cottonseed and Castor Meal . . . . .	6.15	5.75
	Miss Cairo Brand . . . . .	6.68	6.56
	Miss Cairo Brand . . . . .	6.68	6.56
	Miss Cairo Brand . . . . .	6.58	6.56
	Miss Cairo Brand . . . . .	6.79	6.58
	Miss Cairo Brand . . . . .	6.67	6.58
	Miss Cairo Brand . . . . .	6.57	6.58
	Dixie Brand . . . . .	6.74	6.56
	Dixie Brand . . . . .	6.71	6.56
	Dixie Brand . . . . .	6.45	6.56
	Dixie Brand . . . . .	6.75	6.56
	Dixie Brand . . . . .	6.66	6.56
	Dixie Brand . . . . .	6.45	6.56
	Dixie Brand . . . . .	6.61	6.56
	Dixie Brand . . . . .	7.18	6.56
	Dixie Brand . . . . .	6.75	6.56
Humphreys-Godwin Co. . . . .	Dixie Brand . . . . .	6.67	6.56
	Dixie Brand . . . . .	6.61	6.56
	Dixie Brand . . . . .	6.67	6.56
	Dixie Brand . . . . .	6.58	6.56
	Dixie Brand . . . . .	6.99	6.56
	Dixie Brand . . . . .	6.91	6.58
	Dixie Brand . . . . .	6.70	6.58
	Dixie Brand . . . . .	6.83	6.58
	Dixie Brand . . . . .	6.61	6.56
	Dixie Brand . . . . .	6.79	6.56
	Dixie Brand . . . . .	6.59	6.56
	Dixie Brand . . . . .	6.89	6.56
	Dixie Brand . . . . .	6.41	6.56
	Dixie Brand . . . . .	6.67	6.56
	Lovitt Brand . . . . .	6.67	6.56
	Lovitt Brand . . . . .	6.77	6.56
	Lovitt Brand . . . . .	6.60	6.56
L. B. Lovitt & Co. . . . .	Lovitt Brand . . . . .	7.16	6.56
	Lovitt Brand . . . . .	6.65	6.56
	Lovitt Brand . . . . .	6.62	6.56
	Lovitt Brand . . . . .	6.50	6.56

## Brands Showing Commercial Shortage of More than \$1 per Ton.

Ashcraft-Wilkinson Co. . . . .	Off-Color Fertilizer Grade . . . . .	6.69 <sup>a</sup>	6.88
Humphreys-Godwin Co. . . . .	Dixie Brand . . . . .	6.38 <sup>b</sup>	6.56
Maurice Pincoffs & Sons . . . . .	41% Grade (1934 stock) . . . . .	6.21 <sup>c</sup>	6.56

<sup>a</sup> Commercial shortage \$1.08 per ton.<sup>b</sup> Commercial shortage \$1.03 per ton.<sup>c</sup> Commercial shortage \$2.00 per ton.

## Castor Pomace.

MANUFACTURER.	BRAND.	NITROGEN.	
		Found.	Guaranteed.
American Agricultural Chemical Co. . . . .	{ Castor Pomace . . . . .	5.30	4.53
	{ Castor Pomace . . . . .	5.85	4.50
Armour Fertilizer Works . . . . .	{ Castor Pomace . . . . .	5.52	4.52
Baker Castor Oil Co. . . . .	{ Pure Castor Pomace . . . . .	5.53	4.52
Berkshire Chemical Co. . . . .	{ Berkshire Castor Pomace . . . . .	5.03	4.50
Consolidated Rendering Co. . . . .	{ Castor Pomace . . . . .	5.19	4.52
	{ Castor Pomace . . . . .	5.59	4.52
International Agricultural Corp. . . . .	{ Castor Pomace . . . . .	5.88	4.53
	{ Castor Pomace . . . . .	5.29	4.53
Old Deerfield Fertilizer Co., Inc. . . . .	{ O. D. Castor Pomace . . . . .	5.29	4.52

## Calcium Nitrate, Cal-Nitro, Calcium Cyanamid and Urea.

MANUFACTURER.	BRAND.	Number of Samples.	NITROGEN.	
			Found.	Guaranteed.
American Cyanamid Co. . . . .	{ Aero Cyanamid, pulverized . . . . .	1	21.44	22.00
	{ Aero Cyanamid, pulverized . . . . .	1	21.54	22.00
	{ Aero Cyanamid, pulverized . . . . .	1	21.96	22.00
	{ Aero Cyanamid, pulverized . . . . .	1	21.90	22.00
	{ Aero Cyanamid, pulverized . . . . .	1	21.88	22.00
	{ Aero Cyanamid, pulverized . . . . .	1	22.12	22.00
	{ Aero Cyanamid, pulverized . . . . .	1	22.24	22.00
	{ Aero Cyanamid, pulverized . . . . .	2	22.24	22.00
	{ Aero Cyanamid, granular . . . . .	1	21.98	22.00
	{ Aero Cyanamid, granular . . . . .	1	21.92	22.00
Eastern States Farmers' Exchange . . . . .	{ Cal-Nitro . . . . .	7	20.58	20.50
	{ Cal-Nitro . . . . .	1	21.30	20.50
	{ Urea . . . . .	1	46.14	46.00
Foodndrink Fertilizer Co. . . . .	{ Foodndrink (a) . . . . .	1	16.17	13.00
Old Deerfield Fertilizer Co., Inc. . . . .	{ Old Deerfield Urea . . . . .	2	46.03	46.00
Synthetic Nitrogen Products Corp. . . . .	{ Calcium Nitrate . . . . .	4	14.70	15.00
	{ Urea . . . . .	1	46.20	46.00
E. E. Williams (b) . . . . .	{ Synthetic Urea Formula "L" . . . . .	1	43.94	43.00

a Urea in cartridge form for hose attachment.

b Registering the product of Hydrolizer Corp., Elmhurst, Ill.

## Dried Blood, Linseed Meal, and Milorganite.

MANUFACTURER AND BRAND.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.	
		Found.	Guaranteed.	Found	Guaranteed.
Consolidated Rendering Co. . . . .					
Dried Blood . . . . .	2	13.12	13.00	.51	-
New England Rendering Co. . . . .					
Brighton Dried Blood . . . . .	2	11.66	11.51	2.08	-
Olds & Whipple, Inc. . . . .					
Archer-Daniels Linseed Meal . . . . .	1	5.06	5.12	-	-
John Reardon & Sons Co. . . . .					
Rearco Dried Blood . . . . .	1	9.54	10.00	10.28	-
High Grade Dried Blood . . . . .	1	11.15	10.00	1.63	-
Sewerage Commission of Milwaukee . . . . .					
Milorganite . . . . .	6	6.07	6.00	2.72	2.75
Milorganite . . . . .	3	6.12	6.00	2.93	2.75
Spencer Kellogg & Sons . . . . .					
Kellogg's Linseed Meal . . . . .	1	5.28	5.12	-	-

## Phosphoric Acid Compounds.

Superphosphate, Precipitated Bone, and Basic Slag Phosphate.

MANUFACTURER AND BRAND.	Number of Samples.	Total Phosphoric Acid.	AVAILABLE PHOSPHORIC ACID	
			Found.	Guaranteed.
<b>Acme Guano Co.</b>				
16% Superphosphate . . . . .	1	17.48	16.84	16.00
<b>American Agricultural Chemical Co.</b>				
AA 16% Superphosphate . . . . .	1	16.31	15.86	16.00
AA 16% Superphosphate . . . . .	1	16.66	16.48	16.00
AA 16% Superphosphate . . . . .	5	17.09	16.32	16.00
AA 16% Superphosphate . . . . .	1	16.07	15.59	16.00
AA 16% Superphosphate . . . . .	1	16.01	15.57	16.00
AA 16% Superphosphate . . . . .	6	16.58	16.20	16.00
Co-Op 16% Superphosphate . . . . .	6	16.71	16.25	16.00
<b>Apothecaries Hall Co.</b>				
Superphosphate 16% . . . . .	5	17.60	17.34	16.00
<b>Armour Fertilizer Works</b>				
Armours Big Crop 16% Superphosphate . . . . .	7	16.71	16.20	16.00
Armours Big Crop 16% Superphosphate . . . . .	2	16.76	16.12	16.00
<b>Berkshire Chemical Co.</b>				
Berkshire Superphosphate 16% . . . . .	2	16.66	16.23	16.00
Berkshire Precipitated Bone 38% . . . . .	1	40.44	40.44	38.00
<b>Consolidated Rendering Co.</b>				
Superphosphate 16% . . . . .	6	16.58	16.13	16.00
Superphosphate 16% . . . . .	1	18.56	18.30	16.00
Superphosphate 16% . . . . .	7	17.68	17.30	16.00
Superphosphate 16% . . . . .	3	16.63	16.12	16.00
<b>Davison Chemical Co.</b>				
Davison 16% Superphosphate . . . . .	2	17.35	16.71	16.00
<b>Eastern States Farmers' Exchange</b>				
E. S. 32% Double Superphosphate . . . . .	3	33.30	32.92	32.00
E. S. 16% Superphosphate . . . . .	6	18.37	17.73	16.00
E. S. 16% Superphosphate . . . . .	5	17.09	16.38	16.00
E. S. Precipitated Bone . . . . .	1	40.20	39.18	38.00
<b>International Agricultural Corp.</b>				
International 16% Superphosphate . . . . .	8	16.97	16.18	16.00
International 16% Superphosphate . . . . .	5	17.09	16.32	16.00
International 16% Superphosphate . . . . .	7	17.22	16.53	16.00
International Basic Slag . . . . .	3	18.37	16.28	14.40
International Basic Slag . . . . .	3	18.70	16.20	14.40
<b>Old Deerfield Fertilizer Co., Inc.</b>				
Old Deerfield Superphosphate . . . . .	1	18.05	17.62	16.00
Old Deerfield Precipitated Bone . . . . .	1	40.14	38.99	38.00
<b>Rogers &amp; Hubbard Co.</b>				
Hubbard's Superphosphate . . . . .	6	16.46	16.08	16.00
Hubbard's Superphosphate . . . . .	4	17.35	16.97	16.00
<b>F. S. Royster Guano Co.</b>				
Royster 16% Superphosphate . . . . .	1	16.58	16.07	16.00
<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b>				
Bell Brand Superphosphate . . . . .	1	16.90	15.82	16.00
Fish Brand Superphosphate 16% . . . . .	1	16.43	16.12	16.00
Standard U. S. 16% Superphosphate . . . . .	1	16.42	15.48	16.00
<b>C. P. Washburn Co.</b>				
Superphosphate 16% . . . . .	1	17.60	16.96	16.00

## Potash Compounds.

## Muriate and High Grade Sulfate of Potash

MANUFACTURER.	MURIATE OF POTASH.			HIGH GRADE SULFATE OF POTASH.			
	Num- ber of Sam- ples.	POTASH.		Num- ber of Sam- ples.	POTASH.		Chlo- rine.
		Found.	Guaran- teed.		Found.	Guaran- teed.	
American Agricultural Chemi- cal Co. . . . .	{ 1	50.24	50.00	1	49.62	48.00	2.00
	3	49.50	50.00	1	49.54	48.00	1.06
	2	53.84	50.00	1	49.80	48.00	1.06
	{ 1	60.48	60.00	1	48.88	48.00	1.94
	1	60.68	60.00	1	49.36	48.00	2.04
	6	60.00	60.00	—	—	—	—
Apothecaries Hall Co. . . . .	3	59.72	60.00	—	—	—	—
	{ 1	50.82	50.00	1	49.60	48.00	2.42
	1	61.32	60.00	—	—	—	—
Armour Fertilizer Works . . . . .	1	51.20	50.00	—	—	—	—
Berkshire Chemical Co. . . . .	1	51.28	50.00	2	49.52	48.00	2.32
Consolidated Rendering Co. . . . .	{ 6	60.40	60.00	—	—	—	—
	1	61.60	60.00	3	49.92	48.00	1.96
	{ 6	52.76	50.00	—	—	—	—
	2	51.28	50.00	—	—	—	—
Eastern States Farmers' Ex- change . . . . .	1	50.00	50.00	—	—	—	—
	{ 6	61.76	60.00	3	49.60	48.00	1.82
	2	60.84	60.00	—	—	—	—
International Agricultural Corp. . . . .	7	60.52	60.00	1	48.80	48.65	2.20
	{ 3	61.44	60.00	1	49.68	48.00	2.08
	2	51.82	50.00	—	—	—	—
Old Deerfield Fertilizer Co., Inc. . . . .	1	52.72	50.00	2	48.56	48.00	2.14
Rogers & Hubbard Co. . . . .	{ 1	49.80	50.00	1	27.16 <sup>a</sup>	48.00	1.72
	1	50.48	50.00	—	—	—	—

<sup>a</sup>Five bags of this potash were trucked to Greenfield on an order calling for 48% Sulfate of Potash: the purchaser having in mind 48% potassium oxide and the shipper 48% sulfate of potash. The product contained 11.63% magnesium oxide. Proper rebates were allowed for the difference in value.

## Sulfate of Potash-Magnesia.

MANUFACTURER.	Number of Samples.	POTASH.		MAGNESIUM OXIDE.		Chlorine.
		Found.	Guaran- teed.	Acid Soluble.	Water Soluble.	
Eastern States Farmers' Ex- change . . . . .	1	26.80	26.00	9.49	9.42	2.14
Old Deerfield Fertilizer Co., Inc. . . . .	{ 1	28.96	26.00	10.87	10.47	1.82
	1	27.52	26.00	9.64	9.60	2.20

## Products Supplying Nitrogen and Phosphoric Acid.

## Dry Ground Fish.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		Chlorine
		Found.	Guaranteed.	Found.	Guaranteed.	
American Agricultural Chemical Co.	{ 2	9.34	9.00	8.31	6.00	.12
	{ 2	9.29	9.00	8.33	6.00	.05
Armour Fertilizer Works . . .	1	9.09	9.46	7.73	5.00	.57
Berkshire Chemical Co. . . .	{ 2	9.64	9.46	7.15	5.00	.09
	{ 1	9.54	9.46	6.91	5.00	.14
	{ 1	9.72	9.46	8.26	5.00	.14
Consolidated Rendering Co. . .	{ 1	10.05	9.46	8.16	6.00	.12
	{ 1	10.27	9.46	9.51	6.00	1.07
Eastern States Farmers' Exchange	4	9.99	9.00	5.74	5.00	.11
International Agricultural Corp. .	3	10.23	9.00	5.64	4.00	.11
Old Deerfield Fertilizer Co., Inc. .	{ 1	10.01	9.05	7.59	5.00	.13
	{ 1	9.87	9.05	7.91	5.00	.11
Olds & Whipple, Inc. . . . .	1	10.01	9.00	7.06	5.00	.08
Rogers & Hubbard Co. . . . .	{ 4	10.11	9.00	6.28	6.00	.10
	{ 1	9.80	9.00	7.24	5.00	.12
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	1	9.45	9.00	6.85	6.00	.07

## Animal Tankage.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
American Agricultural Chemical Co. . . . .	{ 5	9.86	10.00	7.27	7.41	48.96	51.04
	{ 1	10.02	10.00	7.27	7.41	48.96	51.04
	{ 1	10.36	10.00	6.58	7.41	65.74	34.26
	{ 4	7.40	7.40	9.98	9.15	52.84	47.16
Armour Fertilizer Works . . .	1	7.50	7.40	9.44	9.15	52.70	47.30
Consolidated Rendering Co.	{ 8	10.14	10.00	7.53	6.87	50.32	49.68
	{ 2	8.52	8.22	10.13	10.00	56.66	43.34
	{ 6	7.81	7.41	10.75	9.15	52.19	47.81
	{ 4	7.99	7.41	11.38	9.15	47.82	52.18
International Agricultural Corp. . . . .	{ 3	10.32	10.00	7.53	6.87	48.25	51.75
	{ 2	7.86	7.40	9.62	9.15	57.95	42.05
Old Deerfield Fertilizer Co. . .	1	9.82	10.00	7.92	5.00	54.58	45.42
John Reardon & Sons Co. . . .	1	5.82	5.00	16.38 <sup>a</sup>	10.00	50.93	49.07
N. Roy & Son . . . . .	1	9.28	7.00	8.42	8.00	40.50	59.50
Woodard Bros. . . . .	1	4.84	4.50	20.77	18.00	41.33	58.67

<sup>a</sup> Available phosphoric acid found, 11.02%.

## Ammono-Phos.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		
		Found.	Guaranteed.	Total.	AVAILABLE.	
					Found.	Guaranteed.
American Cyanamid Co. . . . .	1	11.22	11.00	49.62	48.34	48.00
	5	11.38	11.00	49.68	48.63	48.00
	1	11.68	11.00	49.36	48.85	48.00
	1	16.50	16.00	22.85	21.54	20.00

## Ground Bone.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
American Agricultural Chemical Co. . . . .	7	2.66	2.47	25.13	23.00	76.63	23.37
	7	2.72	2.47	25.26	23.00	75.87	24.13
Apothecaries Hall Co. . . . .	1	3.79	3.70	24.24	21.00	66.10	33.90
	1	3.23	2.47	25.21	22.00	82.53	17.47
Armour Fertilizer Works . . . . .	5	2.81	2.47	25.13	23.00	62.19	37.81
	3	2.54	2.47	25.51	23.00	70.19	29.81
Associated Chemical Co. . . . .	1	3.01	2.47	25.64	23.00	65.40	34.60
Berkshire Chemical Co. . . . .	3	2.14	2.05	29.64	25.00	78.99	21.01
	1	4.44	3.70	22.45	20.00	51.19	48.81
Joseph Breck & Sons Corp. . . . .	2	2.54	2.47	26.61	22.88	73.61	26.39
	2	2.56	2.50	24.41	22.50	77.49	22.51
Consolidated Rendering Co. . . . .	7	2.24	2.47	24.75	23.00	72.64	27.36
	5	2.61	2.47	25.26	23.00	77.09	22.91
	1a	2.52	2.05	21.53	22.90	69.62	30.38
	1	3.76	4.00	21.05	20.00	18.58	81.42
Eastern States Farmer's Exchange . . . . .	7	3.03	2.50	23.65	23.00	75.62	24.38
	1	2.99	2.47	22.21	23.00	81.56	18.44
Goulard & Olena, Inc. . . . .	6	2.78	2.40	24.75	22.75	70.30	29.70
Dr. Heinz Co. . . . .	2	1.02	1.00	30.23	29.00	92.45	7.55
A. H. Hoffman, Inc. . . . .	2	4.04	3.70	22.50	20.00	58.60	41.40
International Agricultural Corp. . . . .	5	2.11	2.47	25.26	22.00	77.99	22.01
	1a	2.31	2.47	25.64	22.00	78.81	21.19
Master Meat Products Co. . . . .	5	4.25	4.00	23.66	25.00	32.25	67.75
Old Deerfield Fertilizer Co., Inc. . . . .	2	2.56	2.47	25.13	22.00	71.37	28.63
Olds & Whipple, Inc. . . . .	2	3.32	2.47	22.71	22.00	77.29	22.71
John Reardon & Sons Co. . . . .	6	3.26	2.47	23.68	22.88	62.74	37.26
	2	3.02	2.47	23.34	22.88	61.84	38.16
Rogers & Hubbard Co. . . . .	4	3.04	2.47	27.30	22.85	66.42	33.58
	1	4.28	3.70	23.09	21.50	57.09	42.91
	1	3.92	3.70	26.07	24.70	93.86	6.14
	5	4.24	3.70	22.58	21.50	56.59	43.41
N. Roy & Son . . . . .	3	2.51	2.50	26.48	24.00	56.80	43.20
F. Rynveld & Sons . . . . .	4	2.80	2.47	25.26	22.00	65.53	34.47
	1a	3.61	1.85	21.12	22.88	75.41	24.59
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	1	3.52	2.47	23.98	22.00	75.00	25.00
Swift & Co. . . . .	7	3.18	2.47	24.75	23.00	76.79	23.21
	5	2.76	2.47	25.51	23.00	78.21	21.79
Van Horne Chemical Co., Inc. . . . .	3	3.04	2.40	25.31	22.75	74.64	25.36

a 1934 stock.

## Pulverized Animal Manures.

MANUFACTURER.	BRAND.	Number of Samples.	TOTAL NITROGEN.		TOTAL PHOSPHORIC ACID.		TOTAL POTASH.		Organic Matter.	Mois- ture.
			Found.	Guaran- teed.	Found.	Guaran- teed.	Found.	Guaran- teed.		
American Agricultural Chemical Co. . .	{Pulverized Sheep & Goat Manure {Pulverized Sheep & Goat Manure . .	7 4	1.27 1.25	1.25 1.23	1.08 1.06	1.00 1.00	3.30 3.04	2.00 2.00	30.23 26.11	15.65 19.29
American Chemical Specialties Co. .	Garden Brand Pulverized Sheep Manure (a) . . . . .	1	3.10	2.00	1.79	1.00	1.89	2.00	56.60	9.25
Apothecaries Hall Co. . . . .	{Liberty Domestic Sheep Manure . . {Pulverized Sheep and Goat Manure . .	3 1	1.65 1.25	1.80 1.25	1.10 1.40	1.00 1.00	3.14 2.96	2.00 2.00	45.16 28.03	5.94 9.63
Armour Fertilizer Works . . . . .	{Sheep and Goat Manure . . . . . {Sheep and Goat Manure . . . . .	6 2	1.65 1.83	1.25 1.25	1.15 3.04	1.00 1.00	3.52 3.44	2.00 2.00	32.56 30.76	16.83 16.59
Associated Chemical Co. . . . .	Associated Sheep & Goat Manure . .	1	1.56	1.25	1.25	1.00	4.09	2.00	33.39	18.31
Atkins & Durbrow, Inc. . . . .	{Driconure (1934 stock) . . . . . {Driconure . . . . .	1 3	2.25 1.99	1.00 1.00	.89 .93	1.00 1.00	2.27 1.91	1.00 1.00	77.64 75.78	9.36 10.21
Joseph Breck & Sons Corp. . . . .	{Breck's Rams Head Brand Sheep Manure {Breck's Rams Head Brand Sheep Manure	4 2	1.35 1.27	1.25 1.25	.77 .70	1.00 1.00	3.36 2.58	2.00 2.00	33.23 28.93	9.91 14.29
C. E. Buell, Inc. . . . .	{Two-In-One Peat-Poultry Manure (b) {Two-In-One Peat-Poultry Manure . .	4 1	3.08 3.23	3.00 3.00	3.38 3.19	3.25 3.00	1.55 1.59	1.50 1.50	65.50 60.25	11.71 17.83
Collins Seed Service Co. . . . .	Special Sheep Manure . . . . .	2	2.52	2.25	2.76	1.00	3.07	3.00	28.96	11.85
Consolidated Rendering Co. . . . .	{Corenco Sheep Manure . . . . . {Corenco Sheep Manure . . . . . {Corenco Sheep Manure (1934 stock) . .	8 4 1	1.38 1.26 1.54	1.23 1.23 1.23	1.21 1.12 1.19	.50 .50 .50	3.25 3.09 3.28	2.00 2.00 2.00	26.94 26.75 30.98	18.54 17.95 11.18
Davey Tree Expert Co. . . . .	{Davey Shredded Cattle Manure . . {Davey Shredded Cattle Manure . .	1 1	1.95 2.00	1.00 1.00	1.62 1.51	1.00 1.00	2.27 2.04	2.00 2.00	76.55 78.25	7.50 7.25
Gouldard & Olena, Inc. . . . .	{G. & O. Sheep Manure . . . . . {G. & O. Sheep Manure . . . . .	1 1	1.94 1.40	1.50 1.50	1.59 1.15	1.50 1.50	3.57 3.88	2.00 2.00	37.67 38.84	8.96 5.54
Heil Co. . . . .	Heil Sheep Manure . . . . .	2	2.08	2.00	1.72	1.50	3.88	2.00	70.27	9.03
A. H. Hoffman, Inc. . . . .	{Hoffman's Cow Manure . . . . . {Hoffman's Sheep Manure . . . . .	2 2	2.03 1.76	2.00 1.85	1.49 .92	2.00 1.00	2.04 2.48	2.00 2.00	79.30 51.39	8.05 1.27
International Agricultural Corp. . . .	International Caribbee Sheep Manure .	6	1.32	1.02	1.02	.50	2.98	2.00	27.73	20.85
Natural Guano Co. . . . .	{Sheep's Head Pulverized Sheep Manure {Sheep's Head Pulverized Sheep Manure	6 2	2.26 2.34	2.00 2.00	1.28 1.28	1.00 1.00	4.27 4.41	2.00 2.00	67.74 72.72	10.02 8.48

# INSPECTION OF COMMERCIAL FERTILIZERS

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Old Deerfield Fertilizer Co., Inc.	1	1.52	1.50	1.05	1.00	2.41	2.00	51.51	4.54
{ Old Deerfield Sheep Manure	2	1.58	1.25	.89	1.00	2.54	2.00	46.78	5.35
Pacific Manure & Fertilizer Co.	2	1.50	1.25	.70	1.00	2.76	2.00	38.70	10.26
{ Groz-It Brand Pulverized Sheep Manure	1	1.63	1.25	.83	1.00	2.47	2.00	42.53	9.47
Premier Poultry Manure Co.	2	1.96	1.65	1.15	.85	2.86	2.00	49.67	7.90
{ Premier Brand Shredded Cattle Manure (1934 stock)	1	2.16	1.65	1.08	.85	2.93	2.00	49.96	8.09
{ Premier Pulverized Poultry Manure	5	4.95	4.93	2.55	2.75	1.25	1.30	64.18	8.77
{ Premier Pulverized Poultry Manure	1	5.30	4.93	2.21	2.75	1.30	1.30	64.48	8.68
{ Premier Pulverized Sheep Manure	2	2.25	1.65	1.46c	1.00	2.17	2.00	51.39	5.24
Pulverized Manure Co.	5	2.09	2.00	1.35	1.00	2.04	1.00	57.06	6.89
{ Wizard Brand Shredded Cow Manure	4	2.33	2.00	1.91	1.00	3.57	2.00	70.85	8.10
{ Reagan's Sheep Manure & Wool Waste	1	1.65	45-1.00	.29	3-4	2.89	75-2.50	23.60	3.71
{ Reagan's Sheep Manure & Wool Waste	1	1.16	45-1.00	.42	3-4	3.68	75-2.50	30.73	4.87
{ Reagan's Sheep Manure & Wool Waste	1	.90	45-1.00	.41	3-4	3.24	75-2.50	23.59	3.34
{ Reagan's Sheep Manure & Wool Waste	1	1.22	45-1.00	.32	3-4	3.45	75-2.50	29.10	4.28
{ Reagan's Sheep Manure & Wool Waste	1	1.86	45-1.00	.31	3-4	2.71	75-2.50	18.09	2.62
{ Stock Yard Sheep Manure	1	1.80	75-1.50	.97	4-1.0	1.34	1.00-2.00	39.21	26.77
{ Stock Yard Sheep Manure	1	.80	75-1.50	.38	4-1.0	1.98	1.00-2.00	26.61	10.62
John Reardon & Sons Co.	4	1.65	2.00	.93	1.00	2.43	2.00	46.11	5.95
Rogers & Hubbard Co.	6	1.80	1.25	1.53	.75	4.64	2.00	33.37	10.56
{ Pulverized Sheep and Goat Manure	2	2.00	1.25	2.49	.75	4.56	2.00	36.11	9.77
Van Horne Chemical Co., Inc.	2	2.04	1.50	2.04	1.50	3.82	2.00	37.45	6.47
{ Borung	6	2.21	2.00	2.02	2.00	2.09	2.00	77.95	6.70
{ Bovung	3	2.21	2.00	1.85	2.00	2.00	2.00	80.09	5.75
C. L. Williams	1	1.61	1.00	1.10	1.00	1.98	.50	41.33	11.93
{ Golden Gate Pulverized Sheep Manure (d)									
W. W. Windle Co.	1	2.13	1.75	.66	.38	5.23	5.70	43.73	8.12
{ Natural Sheep Manure Dusted from Wool									

## Brand Showing Commercial Shortage of More than \$1 Per Ton

Premier Poultry Manure Co.	1	4.33	4.93	2.56	2.75	1.23	1.30	62.10	8.23
{ Premier Pulverized Poultry Manure (1934 stock) (e)									

a Carried over from previous years.  
c Manufacturer states that this lot was stored beside a bin of ground bone in bulk and may have received some bone dust while the latter was being handled.  
d Manufactured by the Shelton Co., San Francisco, Cal.

b 1932 stock.

e Commercial shortage, \$2.12 per ton.



## Miscellaneous.

## Cotton Hull Ashes and Wood Ashes.

MANUFACTURER AND BRAND.	Mois- ture.	PHOSPHORIC ACID.		POTASSIUM OXIDE.		Cal- cium. Oxide.	Magne- sium. Oxide.	Insoluble Matter.
		Found.	Guaran- teed.	Found.	Guaran- teed.			
<b>Berkshire Chemical Co.</b>								
Cotton Hull Ashes . . .	8.41	3.02	—	35.76	25.00	9.97	3.59	9.30
Cotton Hull Ashes . . .	6.64	2.84	—	26.44	25.00	8.24	2.79	28.66
<b>John Joynt</b>								
Canada Hardwood Ashes	7.02	1.79	1.00	4.17	3.00	32.29	4.06	15.45
Canada Hardwood Ashes	6.17	2.17	2.00	5.93	5.00	34.43	3.91	10.29
Canada Hardwood Ashes	5.83	2.03	1.00	6.43	3.00	35.22	3.95	9.78
Canada Hardwood Ashes	8.25	2.10	1.00	5.78	3.00	34.43	3.95	9.25
Canada Hardwood Ashes	7.99	1.91	1.00	6.61	3.00	34.76	4.02	8.41
<b>Old Deerfield Fertilizer Co., Inc.</b>								
Cotton Hull Ashes . . .	2.95	1.70	—	25.24	25.00	14.13	7.17	13.64
Cotton Hull Ashes . . .	2.46	1.66	—	25.02	25.00	14.00	7.28	15.74

## Ground Tobacco Stems.

MANUFACTURER.	Moisture.	NITROGEN.		PHOSPHORIC ACID.		POTASSIUM OXIDE.		Organic Matter.
		Found.	Guaran- teed.	Found.	Guaran- teed.	Found.	Guaran- teed.	
Uniform Products Co., Inc.	13.73	2.38	1.75	.38	.25	3.86	3.50	67.40

## Commercial Peat Products.

MANUFACTURER AND BRAND.	Number of Samples.	Water.	Organic Matter.	Mineral Matter.	NITROGEN.	
					Found.	Guaran- teed.
<b>Atkins &amp; Durbrow, Inc.</b>						
Sorbex Moss Peat . . . .	2	19.05	79.70	1.25	.85	—
<b>Brague, Inc.</b>						
Hinsdale Leafmold (Soilco) . . .	1	53.85	41.36	4.79	.69	.50
<b>C. E. Buell, Inc.</b>						
Buell-Boston Ground Peat . . .	3	12.96	85.40	1.64	.85	.75
Buell-Boston Ground Peat . . .	1	13.00	85.38	1.62	.89	.75
<b>Thomas W. Emerson Co.</b>						
Emerson's Peat Moss . . . .	1	14.42	84.25	1.33	1.02	—
<b>Florida Humus Co.</b>						
Florida Humus . . . . .	1	45.61	50.95	3.44	1.86	1.75
Florida Humus . . . . .	2	31.77	63.65	4.58	2.30	2.18
<b>Maplevale Leafmold Co.</b>						
Maplevale Leafmold . . . . .	1	54.69	35.13	10.18	1.00	.25
<b>Mrs. James A. Smith</b>						
Ma-Ches-Ok Leaf Mold Peat . . .	1	55.98	40.51	3.51	.80	1.00

## Stone Meal.

PLANT FOOD ELEMENTS.	MANUFACTURED BY MENDERTH, INC.			MANUFACTURED BY DONALD S. MCCRILLIS.		
	Guaranteed.	Average Found. (a)		Guaranteed.	Found.	
		Soluble in Strong Hydrochloric Acid.	By Fusion Method.		Soluble in Strong Hydrochloric Acid.	By Fusion Method.
Potassium oxide . . .	3.00	1.37	4.38	3.00	.14	.97
Phosphoric acid . . .	.13	.24	.32	.25	.29	.38
Calcium oxide . . .	3.00	1.94	3.67	.56	2.27	5.35
Magnesium oxide . . .	2.00	2.68	3.95	2.00	3.04	4.64

a Results reported are the average analyses of two samples; one drawn in Beverly and one in Norwood, Mass.

Note: The commercial value of the plant food contained in one ton of these stone meal products, based upon their content of strong acid soluble potash, phosphoric acid, calcium and magnesium, would be about \$1.82 for Menderth and \$1.03 for the McCrillis Stone Meal. We believe that these valuations are much in excess of the actual value of the products as sources of plant food for the reason that they are so insoluble.

## Definitions and Interpretations Relating to Fertilizers.

The following definitions and interpretations have been adopted as official by vote of the Association of Official Agricultural Chemists at a meeting held in 1935.

The committee recommends that the water-soluble or available **manganese** in fertilizers be expressed as manganese (Mn).

The term **manganese sulfate**, when applied to an ingredient of a mixed fertilizer, shall designate anhydrous manganous sulfate ( $MnSO_4$ ).

**Cyanamid** is a commercial product composed chiefly of calcium cyanamid ( $CaCN_2$ ), and it shall contain not less than twenty-one per cent (21%) of nitrogen.

The term "**lime**" shall not be used in the registration, labeling, or guaranteeing of fertilizers or fertilizing materials, unless the lime is in a form or forms to neutralize soil acidity.

#### DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZER FOR SALE IN MASSACHUSETTS IN 1935.

Acme Guano Co., 311 Marine Bank Bldg., Baltimore, Md.  
 American Agricultural Chemical Co., 285 River St., North Weymouth, Mass.  
 American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.  
 Apothecaries Hall Co., Waterbury, Conn.  
 Armour Fertilizer Works, 120 Broadway, New York, N. Y.  
 Ashcraft-Wilkinson Co., 601 Trust Co. of Georgia Bldg., Atlanta, Ga.  
 Associated Chemical Co., Baltimore Trust Bldg., Baltimore, Md.  
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.  
 Baker Castor Oil Company of Delaware, 120 Broadway, New York, N. Y.  
 Barrett Co., 40 Rector St., New York, N. Y.  
 Barrie Laboratories, Inc., 272 Center St., Newton, Mass.  
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.  
 Belmont Gardens, 170 Brighton St., Belmont, Mass.  
 Berkshire Chemical Co., Bridgeport, Conn.  
 Woodworth Bradley, Inc., 156 South Main St., Providence, R. I.  
 Brague, Inc., South St., Hinsdale, Mass.  
 Joseph Breck & Sons Corp., Boston, Mass.  
 C. E. Buell, Inc., 6 Beacon St., Boston, Mass.  
 Cairo Meal and Cake Co., Cairo, Ill.  
 Chilean Nitrate Sales Corp., 120 Broadway, New York, N. Y.  
 Clay & Son, Ltd., Stratford, London, England.  
 Collins Seed Service Co., 131 Beverly St., Boston, Mass.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Davey Tree Expert Co., Kent, Ohio.  
 Davison Chemical Co., 1801 Baltimore Trust Bldg., Baltimore, Md.

Jacob Dold Packing Co., 845 William St., Buffalo, N. Y.  
 Eastern States Farmers' Exchange, Springfield, Mass.  
 Thomas W. Emerson Co., 215 State St., Boston, Mass.  
 Ferti-Lawn Co., Inc., Hamilton, N. Y.  
 Florida Humus Co., Zellwood, Florida.  
 Foodndrink Fertilizer Co., 221-A Mt. Auburn St., Cambridge, Mass.  
 Ford Motor Co., 3674 Schaefer Road, Dearborn, Mich.  
 H. L. Frost & Higgins Co., 20 Mill St., Arlington, Mass.  
 Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.  
 Thomas J. Grey Co., 16 South Market St., Boston, Mass.  
 Heil Co., 3000 W. Montana St., Milwaukee, Wis.  
 Dr. Heinz Co., College Hill Station, Cincinnati, Ohio.  
 Thomas Hersom & Co., New Bedford, Mass.  
 A. H. Hoffman, Inc., Landisville, Penn.  
 Hudson Valley Fuel Corp., Troy, N. Y.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 International Agricultural Corp., 28 Chauncey St., Boston, Mass.  
 John Joynt, Lucknow, Ontario, Canada.  
 Spencer Kellogg & Sons, 98 Delaware Ave., Buffalo, N. Y.  
 L. B. Lovitt & Co., Memphis, Tenn.  
 Lowell Fertilizer Co., 178 Atlantic Ave., Boston, Mass.  
 Maplevale Leafmold Co., East Kingston, N. H.  
 Master Meat Products Co., 2500 22nd St., Detroit, Mich.  
 McClain Brothers Co., Canton, Ohio.  
 D. S. McCrillis, Stony Brook, Mass.  
 Menderth, Inc., 126 State St., Boston, Mass.  
 Miller Fertilizer Co., 1801 Baltimore Trust Bldg., Baltimore, Md.  
 Natural Guano Co., Aurora, Ill.  
 New England Chemical Industries, Inc., Woburn, Mass.  
 New England Rendering Co., Rear 39 Market St., Brighton, Mass.  
 Old Deerfield Fertilizer Co., Inc., 28 Sugarloaf St., South Deerfield, Mass.  
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.  
 Pacific Manure & Fertilizer Co., 108-110 Davis St., San Francisco, Cal.  
 F. G. Phillips Co., Circuit Road, Dedham, Mass.  
 Plantabbs Corp., Baltimore, Md.  
 Arthur B. Porter, Inc., 55 Dearborn St., Salem, Mass.  
 Premier Poultry Manure Co., 327 South LaSalle St., Chicago, Ill.  
 Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago, Ill.  
 John J. Reagan, Lynn, Mass.  
 John Reardon & Sons Co., 51 Waverly St., Cambridge, Mass.  
 Rogers & Hubbard Co., Portland, Conn.  
 N. Roy & Son, Rear 618 Newport Ave., South Attleboro, Mass.  
 F. S. Royster Guano Co., 3206 Baltimore Trust Bldg., Baltimore, Md.  
 F. Rynveld & Sons, 149 West 24th St., New York, N. Y.  
 Salem Chemical & Supply Co., Salem, Mass.  
 O. M. Scott & Sons Co., Marysville, Ohio.  
 Sewerage Commission of the City of Milwaukee, Jones Island, Milwaukee, Wis.  
 M. L. Shoemaker & Co., Inc., 3600 North Delaware Ave., Philadelphia, Penn.  
 Mrs. James A. Smith, Concord, Mass.  
 Standard Wholesale Phosphate & Acid Works, Inc., 1600 Mercantile Trust Bldg., Baltimore, Md.  
 Stimulant Laboratories, Inc., 27-26 Jackson Ave., Long Island City, N. Y.  
 Sutton & Sons Ltd., Reading, England.  
 Swift & Company Fertilizer Works, Standard Oil Bldg., Baltimore, Md.  
 F. Sylvester & Son, 86 Baxter St., Melrose, Mass.  
 Synthetic Nitrogen Products Corp., 285 Madison Ave., New York, N. Y.  
 Tennessee Corp., Lockland, Ohio.  
 Uniform Products Co., Inc., 111 Fifth Ave., New York, N. Y.  
 Van Horne Chemical Co., Inc., 399 Halliday St., Jersey City, N. J.  
 Victory Fertilizer Corp., 177 State St., Boston, Mass.  
 Virginia-Carolina Chemical Corp., Seventh and Main Streets, Richmond, Va.  
 Walker-Gordon Laboratory Co., Inc., Plainsboro, N. J.  
 C. P. Washburn Co., Middleboro, Mass.  
 C. L. Williams, Lowell, Mass.  
 E. E. Williams, East Weymouth, Mass.  
 W. W. Windle Co., 95 West Main St., Millbury, Mass.  
 Winslow Nurseries, 2436 Great Plain Ave., Needham, Mass.  
 Woodard Bros., Greenfield, Mass.

MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 82

DECEMBER, 1935

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Inspection of Agricultural  
Lime Products

By H. D. Haskins

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This is the twenty-fourth report on the inspection of agricultural lime products in Massachusetts. It gives the composition of the various products which have been sold in the State during the year. In case of the ground limestone products the mechanical analysis is also given.

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Massachusetts State College  
Amherst, Mass.

# INSPECTION OF AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1935

By H. D. Haskins, Official Chemist<sup>1</sup>

## Manufacturers and Brands

During 1935, twenty-four firms registered for sale in Massachusetts fifty-three brands of lime products advertised and sold for neutralizing acid soils, and one brand of land plaster or gypsum. The products are grouped as follows:

Hydrated or slaked lime . . . . .	31
Ground limestone. . . . .	21
Oyster shell lime . . . . .	1
<hr/>	
Total . . . . .	53
Gypsum . . . . .	1

All of the lime products registered in Massachusetts during the year were sampled and analyzed and the results appear in this bulletin. Most of the samples were secured by the same agents who drew the samples for the fertilizer inspection, and were taken from all parts of the State during a ten-week period following April 1. A few samples were drawn, upon request, during the fall when much of the land in the Connecticut Valley is plowed and limed in preparation for the onion crop to be grown the following spring. The samples numbered 117, represented 54 brands, and were drawn from stock in the possession of 92 agents or owners.

Two products not registered in the State during 1935 have also been included: Jag's Hydrated Pure Lime, manufactured by Atlas Products & Manufacturing Co., Philadelphia, Penn., was found on sale at only one hardware store. It was sold only in small packages and was advertised for general use. The analysis is included since some of it may have been used on local gardens. Herzog's White Lime, manufactured by the Herzog Lime & Stone Co., Forest, Ohio, was sampled at two stores. In both cases the product was sold only in small packages and had been carried over from 1934 when the product was registered. No new lots were sold in Massachusetts during 1935.

## Variations and Deficiencies in the Composition of Lime Products

Lime products used as soil amendments may be divided into two groups, the high calcium and the high magnesium limes, both of which are found among the fine ground limestones as well as among the hydrated products. The high magnesium limes usually have a higher neutralizing value besides furnishing the plant food element magnesium in available form. Some Massachusetts soils are showing evidences of magnesium deficiency, and on such soils the high magnesium products may prove the best selection. Their cost is usually about the same as that of the high calcium products.

Sixty-nine per cent of the lime products analyzed showed no deficiencies, and in many cases where small deficiencies did occur in one of the elements, an overrun of the companion element gave a sufficient increase in neutralizing value so that the small deficiency was of little significance.

<sup>1</sup>Assisted by H. Robert DeRose, First Assistant Chemist; James T. Howard, C. L. Whiting, and G. E. Taylor, Sampling Agents.

Deficiencies in Calcium Oxide Neutralizing Value Shown in  
Table I.

	<i>Per Cent</i>
Brewer & Co., Inc. . . . . Snow Fluff Agricultural Hydrate . . . . .	3.24
Brewer & Co., Inc. . . . . Sure Crop Agricultural Hydrate . . . . .	.57
Herzog Lime and Stone Co. . . . . Herzog's White Lime . . . . .	4.18
H. E. Millard . . . . . Sweet Arrow Hydrated Lime . . . . .	2.44
New England Lime Co. . . . . Nelco Agricultural Hydrate (Canaan) . . . . .	1.95

The Magnesium Agricultural Hydrate manufactured by B. K. Harris was deficient 4.94% in magnesium oxide, but ran 8.15% over the minimum guarantee in calcium oxide, so that the calcium oxide equivalent was well maintained.

Attention is called to the coarse grinding of several of the ground limestone products listed in Table II. Although it may not be practical to grind limestone so that it will all pass through a 100-mesh sieve, yet it is practical, as is demonstrated by many manufacturers listed in this bulletin, to grind sufficiently fine so that 80% will pass a 100-mesh sieve. The following products are comparatively speaking very much coarser and are therefore less immediately effective in neutralizing soil acidity:

Fine Ground Magnesian Lime Stone, American Agricultural Chemical Co.  
High Grade Ground Limestone, Hazen Bros.  
Hoosac Agricultural Limestone, Hoosac Valley Lime Co., Inc.  
Sealshtp Oyster Shell Dust, Producers Sales Co.  
Ashley White Dolomite Agricultural Limestone, D. U. Smith & Brother.

Only one ground limestone showed a serious deficiency. Three samples of Dragon Mainrok Finely Ground Magnesian Limestone, manufactured by the Lawrence Portland Cement Co., showed deficiencies in both calcium and magnesium oxides amounting to 3.09%, 2.98%, and 6.48%, respectively, in terms of calcium oxide equivalent.

#### Explanation of Tables of Analyses

Table I, "Proportion of total oxides as carbonates." The data furnished in this column are calculated from an actual determination of carbon dioxide ( $\text{CO}_2$ ). Calcium or magnesium not in the form of carbonate is present either as hydrated lime (water- or air-slaked), burned lime (caustic or unslaked), or as basic silicate. All of the products listed in this table have at some time been burned, and the proportion of oxides present as carbonates indicates to what extent the product has absorbed carbonic acid from the air.

Table II, "Carbonates of calcium and magnesium." The calculation in this column allows for the small amounts of calcium and magnesium combined as basic silicates; these are readily soluble in mineral acid solutions but obviously should not be classed as carbonates.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass the various meshed sieves mentioned.

Tables I and II. "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "per cent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid has been added.

The figures in parenthesis following the brand name show the number of samples collected and analyzed.

Table 1. Hydrated or Slaked Lime.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		Proportion of Total Oxides as Car- bonates.	NEUTRALIZING VALUE EXPRESSED IN TERMS OF CALCIUM OXIDE.		Insoluble Matter.
	Found.	Guar- anteed.	Found.	Guar- anteed.		Per Cent.	Pounds in One Ton.	
Atlas Products & Manufacturing Co., 511 Cuthbert, St., Philadelphia, Penn.								
Jag's Hydrated Pure Lime (1)	46.05	46.50	31.95	31.00	1/14	89.37	1,787	3.40
Brewer & Co., Inc., 45 Arctic St., Worcester, Mass. (a)								
Green Mountain Handy Hydrate (1)	72.25	65.00	1.45	1.00	1/13	75.02	1,500	1.50
Snow Fluff Agricultural Hydrate (2)	68.87	70.00	3.48	5.00	1/12	73.51	1,470	2.92
Producto Agricultural Lime (1)	73.89	60.00	3.77	1.00	1/8	80.27	1,605	6.92
Sure Crop Agricultural Hydrated Lime (2)	63.60	65.00	1.60	1.00	1/2	64.99	1,300	3.01
Eastern States Farmers' Exchange, Springfield, Mass. (b)								
E. S. Magnesian Hydrated Lime (1)	46.79	47.00	33.02	31.00	1/22	90.35	1,807	1.06
E. S. Hydrated Lime (1)	72.86	70.00	1.38	1.00	1/17	72.84	1,457	1.37
Burton K. Harris, Saylesville, R. I. (c)								
Harris Magnesium Agricultural Hydrate (3)	58.15	50.00	17.06	22.00	1/14	79.61	1,592	4.10
Herzog Lime and Stone Co., Forest, Ohio								
Herzog's White Lime (carried over stock) (1)	45.04	33.00	30.90	20.00	1/9	86.85	1,737	.85
Herzog's White Lime (carried over stock) (1)	45.14	47.20	31.37	32.90	1/10	86.85	1,737	1.48
A. H. Hoffman, Inc., Landisville, Penn.								
Hoffman's Hydrated Lime (3)	69.87	70.00	2.52	1.50	1/13	70.60	1,412	2.19
Hoosac Valley Lime Co., Inc., Adams, Mass.								
Adams Land Lime (1)	61.88	60.00	1.67	.50	1/4	63.18	1,264	3.90
Kelley Island Lime & Transport Co., 1122 Leader Bldg., Cleveland, Ohio								
Tiger All Purpose Hydrated Lime (1)	46.58	33.00	32.60	20.59	1/14	91.11	1,822	.30
Lawrence Portland Cement Co., Thomaston, Maine								
Dragon "Mainrok" Agricultural Hydrated Lime (2)	69.83	68.00	1.30	.20	1/6	70.53	1,411	1.25
Dragon "Mainrok" Land Lime (2)	68.28	60.00	1.72	.20	1/5	68.68	1,374	1.30
Dragon "Mainrok" Magnesian Hydrated Agricultural (2)	64.55	65.00	5.33	4.00	1/6	69.76	1,395	2.65



Lee Lime Corp., Lee, Mass.	Lee Agricultural Hydrated Lime (2)	47.19	47.00	32.02	31.00	1/11	91.96	1,839	1.72
	Lee Agricultural Hydrated Lime (1)	47.08	47.00	32.74	31.00	1/16	91.33	1,827	1.41
	Lee Agricultural Hydrated Lime (1)	37.25	35.00	25.05	25.00	1/2	71.30	1,426	2.42
	Lee Land Lime (1)								
H. E. Millard, Annnville, Penn.	Sweet Arrow Hydrated Lime (3)	66.02	70.00	2.61	1.50	1/4	68.83	1,377	2.08
	Clifford L. Miller, West Stockbridge, Mass.								
Monarque Agricultural Hydrated Lime (2)		60.14	60.00	10.78	4.00	1/15	76.06	1,521	4.42
New England Lime Co., Pittsfield, Mass. (d)	Nelco Agricultural Hydrated Lime (Adams) (1)	71.14	70.00	1.59	.50	1/17	72.94	1,459	2.91
	Nelco Agricultural Hydrated Lime (Canaan) (3)	44.86	47.00	30.14	30.00	1/9	86.29	1,726	1.58
	Nelco Land Lime (3)	39.33	35.00	26.64	25.00	2/5	75.65	1,513	2.04
Rockland & Rockport Lime Corp., Rockland, Maine	R. R. Land Lime — Grade C (3)	63.58	60.00	1.78	.50	1/4	64.16	1,283	2.73
	R. R. Land Lime — Grade M. (2)	61.13	60.00	4.42	4.00	1/4	67.38	1,348	4.17
	Sanlime (1)	70.35	70.00	1.16	.20	1/9	72.51	1,450	.93
	R. R. Land Lime Special High Magnesium (1)	46.71	40.00	26.64	22.00	1/7	83.02	1,660	4.29
	Rockland Agricultural Hydrated Lime (1)	57.55	45.00	19.17	25.00	1/30	82.79	1,656	2.15
	Rockland Agricultural Hydrated Lime (1)	48.77	45.00	28.25	25.00	1/8	85.87	1,717	1.75
A. J. Snyder Lime Co., Rosendale, N. Y.	Rex Brand Hydrated Lime (1)	63.33	50.00	5.80	2.00	1/8	69.90	1,398	5.77
United States Gypsum Co., 300 West Adams St., Chicago, Ill. (e)	U. S. G. Agricultural Hydrated Lime (1)	72.33	70.00	1.45	—	1/16	72.70	1,454	1.64
	U. S. G. Red Top Hydrated Lime (1)	69.94	70.00	1.62	1.00	1/12	72.14	1,443	1.55
	U. S. G. Red Top Hydrated Lime (1)	72.05	70.00	1.16	1.00	1/18	72.51	1,450	1.22
	U. S. G. Agricultural Land Lime (2)	63.60	60.00	1.87	—	1/4	65.56	1,311	4.33
Wm. Zinger Handy Patching Plaster Co., 1509 Pennsylvania Ave., Philadelphia, Pa.	Zinger's Handy Prepared Lime (1)	47.75	48.00	33.11	31.70	1/18	92.18	1,844	.72

aPlant at Winooski, Vt.  
bPlant at Farnams, Mass.  
cShipping point, Berkeley, R. I.  
dPlants at Adams, Mass., and Canaan, Conn.  
ePlants at Farnams, Mass., and Falls Village, Conn.



Table II. Ground Limestone and Oyster Shell Lime

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		CARBONATES OF CALCIUM AND MAGNESIUM		NEUTRALIZING VALUE EXPRESSED IN TERMS OF CALCIUM OXIDE		INSOL- UBLE MATTER	MECHANICAL ANALYSIS (PER CENT)			
	Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.	Per Cent.	Pounds in One Ton.		Finer than 100-mesh	Between 100 and 80-mesh.	Between 80 and 40-mesh.	Between 40 and 20-mesh.
American Agricultural Chemical Co., North Weymouth, Mass.													
Fine Ground Magnesian Limestone (4) (a) . . .	30.74	30.00	21.73	20.00	97.97	95.00	59.46	1189	.89	45.31	4.05	29.07	21.57
Pownal Agricultural Limestone (3) (b) . . . . .	46.68	45.00	5.43	5.00	94.65	90.00	53.79	1076	4.52	81.60	3.16	9.20	6.04
Dominion Lime Co., Lime Ridge, Quebec													
Dudswell Brand Agricultural Limestone (1) (c) .	53.32	52.00	1.45	.20	95.51	94.00	53.79	1076	3.20	84.16	1.45	8.02	6.37
Eastern States Farmers' Exchange, Springfield, Mass. (d)													
E. S. Magnesian Limestone (6) . . . . .	30.65	29.00	20.65	20.00	96.18	93.50	58.06	1161	3.01	82.22	2.27	12.57	2.94
Grangers Manufacturing Co., West Stock- bridge, Mass.													
Grangers (6) . . . . .	40.60	35.00	9.20	1.00	89.05	90.00	51.34	1027	9.64	92.66	2.00	5.34	none
Hazen Brothers, 123 Florence Ave., Arlington, Mass.													
High Grade Ground Limestone (5) . . . . .	53.52	53.71	1.14	.51	97.89	99.18	53.93	1079	2.00	52.70	3.79	31.46	12.05
Hoosac Marble Co., North Adams, Mass.													
Ground Limestone (2) . . . . .	54.14	53.00	1.01	.65	96.61	96.44	54.28	1086	2.40	95.26	2.34	2.40	none
Hoosac Valley Lime Co., Inc.													
Hoosac Agricultural Limestone (1) . . . . .	53.45	50.00	.91	.50	97.28	97.00	54.77	1095	1.87	42.78	2.28	26.51	28.43
Lawrence Portland Cement Co., Thomaston, Maine													
Dragon "Mainrok" Finely Ground Magnesian Limestone (1) . . . . .	27.58	28.00	16.08	18.00	82.85	78.00	47.56	951	16.58	100.00	none	none	none
Dragon "Mainrok" Finely Ground Magnesian Limestone (1) . . . . .	27.19	28.00	16.44	18.00	82.17	78.00	47.28	946	17.44	100.00	none	none	none
Dragon "Mainrok" Finely Ground Magnesian Limestone (1) . . . . .	26.20	28.00	14.63	18.00	77.35	78.00	44.47	889	22.42	100.00	none	none	none
Dragon "Mainrok" Finely Ground High Calcium Limestone (1) . . . . .	54.14	50.00	.87	.20	98.43	95.00	54.77	1095	1.39	100.00	none	none	none

Lee Lime Corporation, Lee, Mass. Lee Agricultural Pulverized Limestone (4) . . .	31.14	30.00	21.56	20.00	96.77	93.00	58.90	1178	1.37	83.34	3.34	10.92	2.40
Limestone Products Corporation of America, Newton, N. J. "Lime Crest" Brand Pulverized Limestone (7) .	44.81	34.00	7.14	1.00	94.89	90.00	53.02	1060	4.98	91.74	2.57	4.89	.80
Clifford L. Miller, West Stockbridge, Mass. Monarque Agricultural Limestone (1) . . .	39.74	35.00	10.88	6.00	92.61	90.00	53.44	1069	6.85	73.53	1.25	8.92	16.30
Monarque Agricultural Dolomite (1) . . .	30.97	30.00	18.72	18.00	90.98	90.00	55.19	1104	7.37	67.77	1.21	9.14	21.88
New England Lime Co., Adams, Mass. Nelco Agricultural Ground Limestone (Canaan) (1)	32.66	30.00	21.95	20.00	92.81	92.00	60.23	1205	1.75	96.03	1.10	2.87	none
Nelco Agricultural Ground Limestone (Adams) (1)	53.37	50.00	.30	none	95.87	95.00	53.30	1066	3.90	93.41	1.57	5.02	none
Producers Sales Co., 144 Water St., South Norwalk, Conn. Seashipt Brand Oyster Shell Dust (1) . . .	48.44	45.00	1.07	.75	88.68	77.00	49.52	990	6.82	48.52	4.42	34.24	12.82
Rockland & Rockport Lime Corporation, Rockland, Maine R. R. Ground Limestone — Grade M (2) . . .	34.04	30.00	18.95	18.00	97.11	94.00	57.22	1144	1.32	87.17	2.25	9.75	.83
R. R. Ground Limestone — Grade C (3) . . .	47.78	48.00	4.78	1.00	94.54	92.00	52.53	1051	5.07	85.97	2.97	8.79	2.27
D. U. Smith & Brother, Ashley Falls, Mass. Ashley White Dolomite Agr. Limestone (5) . . .	30.76	30.00	21.11	21.00	97.59	98.00	58.48	1170	1.70	47.70	4.72	27.10	20.48
Solvay Process Co., Syracuse, N. Y. Solvay Pulverized Limestone (1) . . .	48.08	50.00	3.40	1.50	92.91	92.40	51.76	1035	6.15	94.74	1.32	3.94	none
United States Gypsum Co., 300 West Adams St., Chicago, Ill. (d) U. S. G. Agricultural Limestone (1) . . .	31.06	29.00	21.01	20.00	96.38	93.50	58.69	1174	2.20	87.16	1.96	8.90	1.98

<sup>a</sup>Plant at Ashley Falls, Mass.  
<sup>b</sup>Plant at North Pownal, Vt.

*c*Plant at Dudswell Junction, Quebec, Canada.  
*d*Plant at Falls Village, Conn.

Table III. Gypsum or Land Plaster.

Name of Manufacturer and Brand.	Calcium Oxide (CaO).		Calcium Sulfate (CaSO <sub>4</sub> ).		Calcium and Magnesium Carbonates Found.
	Found.	Guar- anteed.	Found.	Guar- anteed.	
United States Gypsum Co., 300 West Adams St., Chicago, Ill. Ben Franklin Agricultural Gypsum (1) .	32.70	30.00	78.70	64.50	2.00

#### Tonnage of Lime Products Sold as Soil Amendments in Massachusetts during 1934

	<i>Tons</i>
Ground limestone and shell lime . . . . .	19,582
Other forms (largely hydrated and air slaked) . . . . .	6,319
Total . . . . .	25,901

In securing the above statistics three producers failed to furnish us tonnage data; and a conservative estimate was made in these cases. The above figures seem low, for in 1930, 56,336 tons was sold.

#### Lime Definitions

The following definitions of lime products used in agriculture were made official by vote of the Association of Official Agricultural Chemists at their annual meeting in November 1935. The definitions for quick lime and hydrated lime, previously published in our lime bulletin No. 61, December 1931, were revised by vote of the Association upon recommendation of the Committee on Definition of Terms and Interpretation of Results on Fertilizers and Liming Materials.

1. The word **lime** when applied to liming materials means either calcium oxide or calcium and magnesium oxides.

2. **High-calcium products** are materials in which 90 per cent or more of the total calcium and magnesium oxide content consists of calcium oxide.

3. **High-magnesium products** are materials in which more than 10 per cent of the total calcium and magnesium oxide content consists of magnesium oxide.

4. The designations **quick lime**, **burned lime**, **caustic lime**, **lump lime**, **unslaked lime**, shall apply to calcined materials, the major part of which is calcium oxide, in natural association with a lesser amount of magnesium oxide, and which is capable of slaking with water.

5. **Hydrated or slaked lime** is a dry product consisting chiefly of hydroxide of calcium and oxide-hydroxide of magnesium.

6. **Agricultural liming materials** are those lime products whose calcium and magnesium content is capable of neutralizing soil acidity.

**MASSACHUSETTS**  
**AGRICULTURAL EXPERIMENT STATION**

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CONTROL SERIES

BULLETIN No. 83

JULY, 1936

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**Sixteenth Annual Report on  
Eradication of Pullorum Disease  
in Massachusetts**

**By the Poultry Disease Control Laboratory**

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This bulletin reports the results of pullorum-disease testing for the 1935-36 season. Further progress has been made in the eradication of pullorum disease during the season. There have been increases in the number of flocks and birds tested and in the number of tests made, with a reduction in the average percentage of positive tests to the lowest point attained during the sixteen-year testing period. Comments and suggestions concerning the eradication program are presented.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.

# SIXTEENTH ANNUAL REPORT ON PULLORUM DISEASE ERADICATION IN MASSACHUSETTS

1935-1936

By the Poultry Disease Control Laboratory<sup>1</sup>

## Introduction

For the past sixteen years pullorum-disease testing has been carried on in Massachusetts for the purpose of eliminating the disease from breeding flocks. To this end marked progress has been made, since few infected flocks are now detected among the total number tested.

Poultrymen have come to realize the benefits from a pullorum-clean flock and to appreciate the importance of annual testing of all birds on the premises. More poultrymen are becoming eradication-minded, thus stimulating progress in the establishment of additional pullorum-clean flocks. The buying public, whose interest may be in hatching eggs, day-old chicks, or older stock, have also come to realize that purchases should be confined to officially recognized pullorum-clean sources. Through the adoption and execution of a sound eradication program and a cautious policy of buying new stock only from sources officially recognized as pullorum clean, Massachusetts poultrymen can be assured of ultimate success in stamping out the disease.

During the past testing season further progress has been made. The credit for this success is due in large measure to the various agencies which have directly or indirectly aided in fostering the eradication program.

### *Summary of Service Rendered*

Applications received.....	269
Applications cancelled .....	14
Flocks tested.....	255*
Number of tests.....	344,233
Chickens:—	
Routine.....	334,987
Experimental.....	9,094
Fowl other than chickens:—	
Routine.....	139
Experimental.....	13
Owners receiving necropsy service .....	39
Necropsies of reacting birds.....	72

\*Includes three flocks of poultry other than chickens.

### Distribution of Tests and Reactors

Table 1 gives the number of tests and reactors by counties and breeds. A total of 344,081 samples was received from the 11 counties. The average percentage of positive tests was 0.30, which is the lowest attained during 16

<sup>1</sup>Poultry Disease Control Laboratory Staff: H. Van Roekel, Chief of Laboratory; K. L. Bullis, Assistant Veterinary Pathologist; O. S. Flint, Assistant Research Professor; Miriam K. Clarke and Felicia Zimnoski, Laboratory Assistants. Appreciation is extended to Dr. J. B. Lentz for assistance given to the testing work.

TABLE 1. DISTRIBUTION OF TESTS AND REACTORS, BY COUNTIES AND BY BREEDS

Breed	Barnstable	Berkshire	Bristol	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Worcester	Totals	Percent Positive Tests
(Total tests	2,336	4,399	32,439	17,923	28,675	12,834	13,616	44,587	66,146	15,595	48,657	287,207	
Rhode Island Reds.....(Positive tests	0	9	139	10	248	18	1	0	133	6	288	852	0.30
(Total tests	159	.....	4,518	1,261	2,732	1,118	876	8,710	5,508	2,138	650	27,670	
Barred Plymouth Rocks..(Positive tests	0	.....	42	0	12	14	1	0	2	2	0	73	0.26
(Total tests	.....	.....	768	262	.....	.....	.....	2,464	718	7,163	675	12,050	
White Plymouth Rocks..(Positive tests	.....	.....	0	0	.....	.....	.....	0	0	0	0	0	0.00
(Total tests	.....	3,858	1,494	2,382	62	992	137	.....	1,270	.....	365	10,560	
White Leghorns.....(Positive tests	.....	2	5	85	0	0	0	.....	0	.....	0	92	0.87
(Total tests	49	.....	161	46	1,325	488	50	1,992	1,097	.....	1,386	6,594	
Miscellaneous.....(Positive tests	0	.....	0	3	0	0	0	0	0	.....	0	3	0.05
Total Tests.....	2,544	8,257	39,380	21,874	32,794	15,432	14,679	57,753	74,739	24,896	51,733	344,081	
(Number	0	11	186	98	260	32	2	0	135	8	288	1,020	
Positive Tests.....(Percent	0.00	0.13	0.47	0.45	0.79	0.21	0.01	0.00	0.18	0.03	0.56		0.30

years of testing. Two counties, Barnstable and Middlesex, had no reactors among the birds tested. The latter county had 57,753 birds tested. Less than 0.80 percent of the birds tested in any county were found to be positive. Eight counties showed an increase in testing over the 1934-35 season, while three (Bristol, Hampshire, and Plymouth) showed a decrease.

One breed (White Plymouth Rocks), represented by 12,050 birds, revealed no reactors. This same breed showed no reactors in 1934-35.

Of the total number of samples tested, 313,333 were from females and 30,748 from males. Of these, 0.31 and 0.17 percent, respectively, were positive.

### Annual Testing Effective in Eradication

Table 2 shows that 252 flocks, representing 329,659 birds, were tested. In the 43 flocks tested for the first time and representing 21,119 birds and 21,892 tests, the percentage of positive tests was 2.55, which is a slight increase over the corresponding percentage (2.17) for the 1934-35 season. In this group 31 flocks were classified as non-reacting, but of these 10 were only partially tested. The results for this group of flocks appear quite similar to those of the previous season, indicating possibly that, as additional new flocks are tested, heavy infection may not be anticipated. This can be attributed largely to the fact that more and more poultrymen are seeking pullorum-disease-clean stock.

In the flocks tested intermittently and those tested for two consecutive years, increases are observed in the number of tested flocks, birds, and tests. It is encouraging to note that in both groups the percentage of positive tests is less than for the previous season, while the number of non-reacting flocks is greater.

The most interesting group is the one made up of flocks tested for three or more consecutive years and consists of 151 flocks, representing 263,400 birds and 271,410 tests. Only 0.10 percent of the tests were positive, which is the lowest percentage attained during the 16-year testing period. The number of birds in flocks tested for three or more consecutive years represents 79.9 percent of the total birds tested. Furthermore, 148 flocks were classified as non-reacting while only 3 were positive. It is very apparent that annual testing of all the birds on the premises has been effective in establishing and maintaining pullorum-disease-clean flocks.

TABLE 2. ANNUAL TESTING VERSUS SINGLE AND INTERMITTENT TESTING

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100 % Tested	Partially Tested	100 % Tested	Partially Tested
Tested for the first time.....	43	21,119	21,892	558	2.55	21	10	10	2
Intermittent testing .....	29	20,385	21,138	48	0.23	20	6	2	1
Two consecutive years.....	29	24,755	29,641	144	0.49	20	5	2	2
Three or more consecutive years	151	263,400	271,410	270	0.10	123	25	2	1
Totals .....	252	329,659	344,081	1,020	0.30	184	46	16	6

It is encouraging indeed to note that only 22 of the 252 flocks tested were classified as positive. The percentage of flock owners who tested all the birds on the premises has increased from 74.5 in 1934-35 to 79.3 in 1935-36.

### Appearance of Infection in Flocks Previously Negative

Seven flocks that were non-reacting in 1934-35 revealed infection during the 1935-36 season. Table 3 shows that in three flocks the infection was attributed to faulty management in preventing the introduction of infection; in three flocks the origin was unknown; and for one flock no information was obtained. While the percentage (4.36) of "breaks" among the previously 100 percent tested, non-reacting flocks may be small, yet the explanation for the source of infection suggests that re-infection of some flocks could readily have been avoided. Poultrymen should not overlook or minimize the possible pullorum-disease hazards which may cause serious mortality in their flocks, as well as other losses. The axiom, "an ounce of prevention is worth a pound of cure," cannot be abused by overindulgence. At the present time in the State of Massachusetts one should not experience any difficulty in obtaining reliable and authentic information concerning pullorum-disease-tested flocks. It is a safe policy to investigate thoroughly before dealing with flocks that may be infected.

TABLE 3. APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

Flock	Number of Years Negative	1935-36 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	2	{ 1,779 1,770	{ 1,779 *437	{ 0.06 0.00	Unknown
2	1	277	277	0.72	No information
3	1	758	758	0.53	Combination of sources
4	7	{ 634 630	{ 633 *119	{ 0.32 0.00	Unknown
5	7	{ 3,617 3,600	{ 3,616 *609	{ 0.36 0.00	Introduction of stock from un- tested flocks
6	5	{ 2,072 2,070	{ 2,072 *510	{ 0.10 0.00	Unknown
7	2	1,083	1,077	0.09	Combination of sources

\*Represents retests.

### Non-Reacting and Positive Flocks Classified by Counties

In Table 4 non-reacting and positive flocks are classified by counties. In the 11 counties, 230 flocks, representing 315,215 birds, were found to be non-reacting. Middlesex had the largest number (48) of non-reacting flocks, while



TABLE 4. NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

County	100 % Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
<b>Non-Reacting Flocks</b>						
Barnstable.....	2	2,544	—	—	2	2,544
Berkshire.....	3	5,139	2	585	5	5,724
Bristol .....	18	27,605	7	3,576	25	31,181
Essex .....	10	8,997	9	10,502	19	19,499
Franklin .....	20	26,974	1	55	21	27,029
Hampden .....	17	14,241	1	488	18	14,729
Hampshire .....	15	13,760	2	529	17	14,289
Middlesex .....	38	53,575	10	4,178	48	57,753
Norfolk .....	14	66,263	6	3,666	20	69,929
Plymouth .....	15	20,484	6	3,761	21	24,245
Worcester .....	32	47,148	2	1,145	34	48,293
Totals.....	184	286,730	46	28,485	230	315,215
<b>Positive Flocks</b>						
Berkshire.....	3	2,533	—	—	3	2,533
Bristol .....	3	1,684	2	1,701	5	3,385
Essex .....	2	2,256	—	—	2	2,256
Franklin .....	—	—	1	481	1	481
Hampden .....	1	37	1	430	2	467
Hampshire .....	1	390	—	—	1	390
Norfolk .....	2	1,366	1	1,221	3	2,587
Worcester .....	4	2,169	1	176	5	2,345
Totals.....	16	10,435	6	4,009	22	14,444

Norfolk County led in the number (69,929) of birds in non-reacting flocks. Of the total birds tested, 95.6 percent were in non-reacting flocks, a definite increase over the percentage (89.5) for the 1934-35 season. Furthermore, among the 315,215 birds in the negative flocks, 90.9 percent were in the 100 percent tested flocks.

The number (22) of positive flocks shows a reduction from the previous season. Of the total birds tested, 14,444 or 4.4 percent were in the positive flocks.

These results show that continued progress is being made toward establishing and maintaining pullorum-clean flocks. An annual decrease in the number of positive flocks, which represents a small portion of the total tested birds, clearly demonstrates that pullorum infection can be eliminated if proper measures are followed. While the number of tested flocks represents only a small percentage of the total flocks in Massachusetts, yet the birds in the pullorum-disease-clean flocks serve as a nucleus from which many additional clean flocks can be established. This fact is quite evident as manifested in the group of flocks tested for the first time. The Massachusetts poultry industry is in a fortunate position to be able to replace the majority, if not all, of the infected flocks in the State. A concerted and organized effort should be made toward educating and stimulating the poultrymen to replace infected

flocks by buying from local flocks which are officially recognized as pullorum-disease clean. Since Massachusetts is bounded by states which have made similar progress in pullorum-disease eradication, the proposal is made that the New England poultry industry might well consider and adopt steps that would hasten the elimination of the residual pullorum infection which exists in the New England area and also adopt measures which would minimize or prevent the introduction of infection from other areas.

### Comparison of 1934-35 and 1935-36 Seasons

The results of the 1934-35 and 1935-36 testing seasons are compared in Table 5. Increases are noted in tested flocks (8), tested birds (48,535), tests (42,194), and non-reacting flocks (17). The percentage of positive tests was reduced from 0.39 to 0.30. All counties had less than 0.8 percent positive tests among the samples tested. For two consecutive testing seasons all counties have had less than 1 percent reactors among the tested birds. This suggests that the amount of infection detected each year is too slight to allow any great reduction in the percentage of infection.

TABLE 5. COMPARISON OF 1934-35 AND 1935-36 TESTING

County	Flocks	Birds	Tests	Positive Tests Percent	Non-Reacting Flocks
1934-35 Season					
Barnstable .....	3	2,442	2,442	0.00	3
Berkshire .....	7	6,635	6,635	0.59	3
Bristol .....	34	36,191	43,807	0.77	28
Essex .....	16	12,680	13,621	0.23	15
Franklin .....	15	19,647	19,647	0.90	12
Hampden .....	19	12,579	14,721	0.41	15
Hampshire .....	21	16,054	18,340	0.82	19
Middlesex .....	49	54,081	56,985	0.43	45
Norfolk .....	22	57,531	57,622	0.005	22
Plymouth .....	24	24,957	24,957	0.00	24
Suffolk .....	1	597	597	0.00	1
Worcester .....	33	37,730	42,513	0.33	26
Totals .....	244	281,124	301,887	0.39	213
1935-36 Season					
Barnstable .....	2	2,544	2,544	0.00	2
Berkshire .....	8	8,257	8,257	0.13	5
Bristol .....	30	34,566	39,380	0.47	25
Essex .....	21	21,755	21,874	0.45	19
Franklin .....	22	27,510	32,794	0.79	21
Hampden .....	20	15,196	15,432	0.21	18
Hampshire .....	18	14,679	14,679	0.01	17
Middlesex .....	48	57,753	57,753	0.00	48
Norfolk .....	23	72,516	74,739	0.18	20
Plymouth .....	21	24,245	24,896	0.03	21
Worcester .....	39	50,638	51,733	0.56	34
Totals .....	252	329,659	344,081	0.30	230

### Comments and Suggestions

As stated elsewhere in this report, the marked progress that has been and is being made in pullorum-disease eradication should be credited in a large measure to the splendid cooperation of the poultrymen. The laboratory is doing its part to reciprocate by rendering the highest quality of service which the present organization and facilities will permit.

Poultrymen are requested to comment on the quality of service rendered by the blood collectors. Since it is impossible to follow the field work with the same degree of supervision as the laboratory work, we are forced of necessity to ask the poultrymen to report on the type of field service received. Naturally, we expect a difference in personalities among the personnel on our staff of blood collectors. This is likewise true among the poultrymen. Certain personalities may clash, and consequently unfavorable reports may be received from either the poultryman or the blood collector. The laboratory asks that tolerance be exercised, but not at the expense of accuracy or quality of the work. Suggestions and criticisms will be given due consideration.

Since the great majority of flocks tested each year are non-reacting, occasional flocks will reveal doubtful reacting birds which are difficult to classify as being either negative or positive for pullorum infection. In such instances the agglutination test alone does not give sufficient evidence to enable the laboratory to make a definite diagnosis. Experience has shown that these doubtful-reacting birds can be more accurately diagnosed if they are sent to the laboratory for necropsy. After the bird has been killed and examined with no findings of pullorum infection, the laboratory regards such birds as negative, and the flock owner will receive a negative testing report. However, if the owner fails to submit doubtful-reacting birds which have been requested by the laboratory, he cannot expect his flock to be regarded as negative, because occasionally pullorum infection is recovered from doubtful reactors or birds giving a weak reaction. Furthermore, it has been suggested that the doubtful reaction might be due to faulty operation of the testing process. This suggestion can be ruled out if, after the doubtful reactors arrive at the laboratory, they continue to give the same type of reaction observed earlier. The doubtful reactor has been a great annoyance to the laboratory worker as well as to the poultryman. Inasmuch as the cause or causes of the doubtful reactor are not known, and since such reactors may be indistinguishable from pullorum-disease reactors, poultrymen are requested, for their own safety, to treat doubtful-reacting birds as advised by the laboratory.

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MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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Inspection of Commercial  
Fertilizers

By H. D. Haskins

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This is the sixty-third report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

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Massachusetts State College  
Amherst, Mass.

# INSPECTION OF COMMERCIAL FERTILIZERS FOR THE SEASON OF 1936

By H. D. Haskins, Official Chemist

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## MANUFACTURERS AND BRANDS

Registrations have been perfected in Massachusetts during 1936 by 89 firms, covering 490 brands of mixed fertilizer and unmixed fertilizing materials. The nature of these products is shown by the following classification:

Complete fertilizers . . . . .	290
Ammoniated superphosphates . . . . .	1
Superphosphates with potash . . . . .	1
Dry ground fish, tankage and ground bone . . . . .	48
Fertilizer simples, including organic nitrogen compounds . . . . .	104
Tobacco stems . . . . .	1
Pulverized manures . . . . .	29
Cotton hull ashes and wood ashes . . . . .	6
Peat products . . . . .	2
Stone meal . . . . .	1
Nitrate of potash . . . . .	7
 Total . . . . .	 490

<sup>1</sup>Assisted by H. Robert DeRose, John W. Kuzmeski, Albert F. Spelman, Walter Wainio, Chemists; James T. Howard, C. L. Whiting, G. E. Taylor, Sampling Agents; Harry L. Allen, Laboratory Assistant; Cora B. Grover, Clerk.

Samples of the following brands were not drawn as they were not found on display by our sampling agents.

### Brands of Fertilizer Registered but Not Sampled.

MANUFACTURER AND BRAND.	MANUFACTURER AND BRAND.
American Agricultural Chemical Co. Co-op 8-16-14 Fertilizer	Eastern States Farmers' Exchange Eastern States Castor Pomace (4.5-0-0)
Apothecaries Hall Co. Liberty Tobacco Mixture 6-3-5 Cotton Hull Ashes (0-0-25) Linseed Meal — "Archer-Daniels-Midland Co." (5.44-0-0) Nitrate of Potash (13-0-44)	Olds & Whipple, Inc. Wilcox Potato & General Purpose Fertilizer 4-8-7 O & W Nitrate of Potash (13-0-44)
Cairo Meal and Cake Co. "Miss Cairo" Brand 41% Protein Cotton-seed Meal (6.58-0-0)	Rogers & Hubbard Co. Cotton Hull Ash (0-0-30) Linseed Meal 37% Protein (5.75-0-0)

### Drawing of Samples.

Between April 1 and June 15, three sampling agents made a thorough canvass of the state: James T. Howard in Hampshire, Hampden, Franklin and Berkshire Counties; G. E. Taylor in Norfolk, Bristol, Plymouth, Barnstable and Dukes Counties; and C. L. Whiting in Essex, Middlesex, Suffolk and Worcester Counties. They visited 189 towns, took 1,667 samples, representing 479 brands, from stock in the possession of 516 agents or owners, and called upon 282 agents where no samples were drawn because the agency had been discontinued, the stock was all sold out, or sufficient samples had already been taken of the brands found. They sampled 19,097 sacks, representing 13,935 tons of fertilizer. One ton was sampled to every four and five-eighths tons sold in the state.

### COMPARATIVE COST OF FERTILIZER CHEMICALS AND UNMIXED FERTILIZER PRODUCTS.

Ammonium sulfate, nitrate of soda and calcium nitrate have either shown but little change or have shown a slight decline in price for the six-month period ending March 1. During the early fall the price of each has somewhat strengthened. Nitrate of potash for the six months ending March 1, 1936, showed a decline in price of \$2.25 per ton as compared with the same period in 1935.

Organic animal ammoniates and dry ground fish have shown an appreciable advance in price during the season. On the other hand, synthetic urea, cottonseed meal and castor pomace have shown a decline, but for the organic vegetable products the price has increased as the season has advanced.

Superphosphate has shown a consistent decline in price during the season and was quoted 50 cents per ton lower on September 28, 1936, than for the six months ending March 1, 1935.

Potash salts did not vary materially in price during the six months ending March 1, 1936, as compared with the same period for 1935. The September 28, 1936, quotations, however, show a consistent advance in price for all potash salts used in fertilizers.

This brief summary might indicate a slight advance in price of mixed commercial fertilizers for the season of 1937.

## Wholesale Quotations on Chemicals and Unmixed Materials.

NATURE OF MATERIAL.	AVERAGE PRICE PER TON FOR SIX MONTHS PRECEDING MARCH 1.		Price Per Ton Sept. 28, 1936.	Difference Between Sept. 28 Price and Six Months' Average: Sept. 1, 1935- Mar. 1, 1936.
	1935.	1936.		
Ammonium sulfate (20.5% N), 200 lb. bags, northern ports	\$25.80	\$25.50	\$27.00	+\$1.50
Nitrate of soda (15.5% N), bags, natural or synthetic, ex vessel	25.50	25.50	26.50	+1.00
Nitrate of lime (15% N), bags, northern ports, ex vessel	25.88	24.75	26.10	+1.35
Nitrate of potash (13% N, 44% K <sub>2</sub> O), bags, c.i.f. ports	48.15	45.90	*	
Urea (46% N), car lots, bags, ex vessel	110.00	101.88	95.00	-6.88
Dried blood (12.34% N), ground, bulk, New York	44.94	45.51	63.00	+17.49
Hoof meal (14.15% N), f.o.b. Chicago	44.53	46.91	48.16	+1.25
Animal tankage (8.23% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), ground, bulk, New York	28.59	30.58	41.00	+10.42
Dry ground fish (9.02% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), bags, Baltimore	39.56	40.04	47.00	+6.96
Cottonseed meal (5.75% N), bags, at mill	33.38	22.39	30.00	+7.61
Castor pomace (4.52% N), bags, car lots, f.o.b. works	18.45	16.25	18.50	+2.25
Ground bone (2.47% N, 22.88% P <sub>2</sub> O <sub>5</sub> ), bags, f.o.b. Chicago	16.96	18.31	19.00	+.69
Superphosphate (16% avail. P <sub>2</sub> O <sub>5</sub> ), bulk, f.o.b. Baltimore	8.50	8.25	8.00	-.25
Muriate of potash (50.54% K <sub>2</sub> O), bags, c.i.f. ports	22.00	22.50	25.27	+2.77
High grade sulfate of potash (48.65% K <sub>2</sub> O), bags, c.i.f.	35.00	33.75	36.25	+2.50
Potash-magnesia sulfate (25.94% K <sub>2</sub> O), bags	22.50	22.25	24.75	+2.50
Cotton hull ashes (25% K <sub>2</sub> O), bulk, delivered, car lots	21.25	23.28	25.00	+1.72

\* Not quoted.

## Fertilizer Trade Values.

FORM OF PLANT FOOD.	Value per Pound.	Unit Value.
Nitrogen.		
In ammonia salts	\$0.075	\$1.50
In nitrates	.0975	1.95
Organic nitrogen in fish	.20	4.00
Organic nitrogen in blood, meat and hoof meal	.215	4.30
Organic nitrogen in fine <sup>1</sup> bone and tankage	.2325	4.65
Organic nitrogen in coarse <sup>1</sup> bone and tankage and in pulverized manures	.16	3.20
Organic nitrogen in mixed fertilizers	.19	3.80
Organic nitrogen in cottonseed meal, castor pomace, linseed meal, etc.	.225	4.50
Organic nitrogen in urea and calurea	.115	2.30
Organic nitrogen in cyanamid	.085	1.70
Phosphoric Acid.		
Soluble in water and neutral citrate of ammonia (available)	.05	1.00
In precipitated bone	.0475	.95
In basic slag phosphate	.06	1.20
In fine <sup>1</sup> bone and tankage, and in fish	.04	.80
In coarse <sup>1</sup> bone and tankage	.035	.70
In pulverized manures, seed residues, and ashes	.035	.70
Insoluble in neutral citrate of ammonia in mixed fertilizers	.015	.30
Potash.		
As sulfate	.0415	.83
As muriate	.0275	.55
As carbonate	.10	2.00
As nitrate	.035	.70
In potash-magnesia sulfate	.0525	1.05
In cotton hull and wood ashes (soluble)	.062	1.24
In organic vegetable compounds, sheep manure, and insoluble in ashes	.035	.70
Magnesium Oxide.		
Water soluble from Kieserite and Emjeo	.0615	1.23
In form of finely ground dolomite	.00625	.125

<sup>1</sup>Fine bone and tankage refers to particles which, as sampled, will pass through a sieve with circular openings 1/50 of an inch in diameter. Coarse bone and tankage refers to that portion which will not pass through the sieve.

The foregoing fertilizer trade values are based on average wholesale quotations of fertilizer chemicals and unmixed materials, as taken from trade journals for six months ending March 1, 1936, to which 20 per cent has been added for overhead. When appropriate, an additional allowance has also been made for bags, labor and transportation.

### FERTILIZER TONNAGE.

#### Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts.

	July 1, 1933, to July 1, 1934.	July 1, 1934, to July 1, 1935.	July 1, 1935, to July 1, 1936.
Mixed fertilizers	40,160	42,912	43,682
Fertilizer chemicals and materials unmixed	15,870	18,711	19,165
Pulverized natural manures . . . . .	1,614	1,585	1,634
Totals . . . . .	57,644	63,208	64,481

There were 1,273 tons more fertilizer sold in the state in 1936 than during the previous year. The tonnage of mixed fertilizer was 770 more, and that of the fertilizer chemicals and unmixed materials was 454 more than for 1935. Pulverized manures showed an increase of 49 tons. Of the total tonnage sold, 67.7 per cent was mixed fertilizer, 29.7 per cent was unmixed materials, and 2.6 per cent was dried and pulverized natural manures.

### Plant Food Tonnage.

	Nitrogen.		Phosphoric Acid.		Potash.	
	1935.	1936.	1935.	1936.	1935.	1936.
Mixed fertilizers	2,231	2,238*	3,775	3,727*	3,048	3,097*
Fertilizer chemicals and materials unmixed	1,308	1,386	1,670	1,667	585	672
Pulverized natural manures . . . . .	33	35	25	25	44	47
Totals . . . . .	3,572	3,659	5,470	5,419	3,677	3,816

\* Does not include plant food tonnage of 510 tons of fertilizer mixed for special orders.

There were 175 more tons of plant food sold in the state than during 1935, of which 87 tons were nitrogen and 139 tons potash: the available phosphoric acid showed a decrease of 51 tons.

There were 12,894 tons of plant food sold, of which 28 per cent was nitrogen, 42 per cent available phosphoric acid, and 30 per cent potash. Mixed fertilizers furnished 70 per cent of the plant food, chemicals and unmixed materials 29 per cent, and pulverized manures 1 per cent.

The three plant food elements were furnished in the following proportions by the mixed fertilizers and the unmixed materials, including the pulverized manures: nitrogen, 61 per cent from mixed and 39 per cent from unmixed; phosphoric acid, 69 per cent from mixed and 31 per cent from unmixed; potash, 81 per cent from mixed and 19 per cent from unmixed.

The following tables present tonnage figures for one year, July 1, 1935, to July 1, 1936, for both mixed fertilizers and unmixed fertilizer materials. In case of the mixed fertilizers the grade represents the plant food guarantee of each fertilizer and is expressed in the order of nitrogen, available phosphoric acid, potash.



## Tonnage of Mixed Fertilizers.

## COMPLETE FERTILIZERS.

*14 Per Cent or More of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash).*

Grade.	Tonnage.	Brands.	Grade.	Tonnage.	Brands.
5-8-7	13,752	30	4-6-10	69	-
4-8-4	7,122	28	5-7-3	66	-
4-8-7	3,526	22	10-6-4	65	-
7-6-6	2,074	13	2-12-4	60	-
4-8-10	2,053	16	8-6-6	54	-
6-3-6	1,402	8	6-6-4	50	-
4-8-8	1,112	-	10-3-3	49	-
3-10-4	1,013	9	10-5-10	39	-
4-12-4	983	-	7-3-7	35	-
5-8-10	930	8	7-13-11	31	-
8-16-14	905	14	3-7-6	27	-
8-16-16	827	-	6-11-10	25	-
3-10-6	678	-	8-6-4	23	-
6-3-7	637	-	5-9-2	21	-
4-10-4	632	-	4-8-5	18	-
6-8-6	539	-	6-4-14	18	-
5-10-5	338	-	10-6-6	18	-
5-8-12	316	-	2-10-2	17	-
5-6-4	303	-	4-10-3	17	-
5-10-4	283	-	6-3-5	17	-
8-24-8	263	-	7-8-6	17	-
5-10-10	233	-	8-8-8	15	-
8-5-8	190	-	5-8-16	14	-
5-4-15	189	-	4-16-4	13	-
12-16-12	187	-	8-12-20	13	-
8-6-2	138	-	2-12-2	12	-
9-6-6	119	-	5-8-6	12	-
6-7-4	115	-	8-20-12	12	-
5-5-5	114	-	3-8-4	11	-
7-5-3	104	-	6-8-2	11	-
8-16-20	104	-	15-30-15	11	-
5-9-8	93	-	4-8-6	10	-
12-4-4	93	-	8-6-3	10	-
2-8-10	86	-	5-8-5	10	-
5-5-15	86	-	Miscellaneous	50	21
4-16-20	81	-	Special Mixtures	510	-
7-12-10	78	-			
6-6-5	71	-	Totals	43,219	276

*Less than 14 Per Cent of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash).*

5-3-5	331	7	4-6-3	10	-
4-2-2	50	-	5-6-2	10	-
3-3-3	15	-	Miscellaneous	2	2
3-3-2	14	-			
			Totals	432	14

## SUPERPHOSPHATE WITH POTASH.

## AMMONIATED SUPERPHOSPHATE.

0-14-6	26	-	4-10-0	5	-
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Of the 43,219 tons of complete fertilizer sold, 76 per cent was furnished by 9 grades and 133 brands. Double- and multiple-strength grades totaled 2,416 tons and 29 brands, which was 429 tons more than during the previous year.

Of the mixed fertilizer sold, 99 per cent contained 14 per cent or over of available plant food.

There were 268 tons less of low-analysis (less than 14 per cent available plant food) complete fertilizers sold than in 1935. The 5-3-5 grade, comprising 7 brands, furnished 77 per cent of the tonnage of this class of goods.

In the following table are listed ten of the most popular grades of mixed fertilizer together with the tonnage of each sold in Massachusetts for the years 1935 and 1936.

1935.		1936.	
GRADE.	Tonnage.	GRADE.	Tonnage.
5-8-7 . . . . .	14,111	5-8-7 . . . . .	13,752
4-8-4 . . . . .	7,491	4-8-4 . . . . .	7,122
4-8-7 . . . . .	3,921	4-8-7 . . . . .	3,526
4-8-10 . . . . .	2,131	7-6-6 . . . . .	2,074
7-6-6 . . . . .	1,980	4-8-10 . . . . .	2,053
3-10-4 . . . . .	1,107	6-3-6 . . . . .	1,402
4-8-8 . . . . .	1,048	4-8-8 . . . . .	1,112
4-12-4 . . . . .	939	3-10-4 . . . . .	1,013
5-8-10 . . . . .	879	4-12-4 . . . . .	983
6-3-6 . . . . .	851	5-8-10 . . . . .	930

The following table shows how the tonnage sold in 1936 corresponds with the New England Standard Nine grades selected by the New England Agronomists in 1931.

NEW ENGLAND STANDARD NINE GRADES.	Tonnage.	Additional Tonnage from Grades Varying but 1% in One or More Plant Foods.	Total.
5-8-7 . . . . .	13,752	7,211 <sup>a</sup>	20,963
4-8-4 . . . . .	7,471 <sup>b</sup>	105	7,576
6-3-6 . . . . .	1,442 <sup>c</sup>	1,020	2,462
7-6-6 . . . . .	2,074	125	2,199
4-8-10 . . . . .	2,157 <sup>d</sup>	—	2,157
3-10-4 . . . . .	1,013	649	1,662
5-8-10 . . . . .	930	—	930
2-8-10 . . . . .	167 <sup>e</sup>	—	167
2-12-4 . . . . .	60	—	60
Totals . . . . .	29,066	9,110	38,176

<sup>a</sup> Including 905 tons of 8-16-14, 827 tons of 8-16-16, and 187 tons of 12-16-12.

<sup>b</sup> Including 338 tons of 5-10-5 and 11 tons of 15-30-15.

<sup>c</sup> Including 39 tons of 10-5-10 and 1 ton of 8-4-8.

<sup>d</sup> Including 104 tons of 8-16-20.

<sup>e</sup> Including 81 tons of 4-16-20.

Of the total tonnage of mixed fertilizer sold in Massachusetts, 67 per cent was from grades recommended by New England Agronomists to meet New England conditions, and 21 per cent additional tonnage was from grades varying but one per cent in one or more plant food elements from the grades thus recommended. Of the ten grades, including the multiple strength mixtures, that have the highest tonnage (36,640 tons), all but three were among the New England Standard Nine. These seven grades showed a total tonnage of 28,839.

Over 20 per cent of the total tonnage of mixed fertilizer was from five grades not included in the New England Standard Nine. They are 4-8-7, 8-16-14, third largest tonnage sold; 4-8-8, 8-16-16, sixth largest; 4-12-4, 8-24-8, eighth largest; 3-10-6, thirteenth largest; and 6-3-7, fourteenth largest.

The tonnage of unmixed materials, as shown in the following table, was distributed as follows: nitrogen products, 40 per cent; phosphoric acid products, 29 per cent; potash products, 6 per cent; tankage, fish, bone, nitrate of potash, Ammo-Phos, and wood ashes, 19 per cent; and miscellaneous, 6 per cent. Pulverized animal manures are not included.

## Tonnage of Unmixed Fertilizing Materials.

MATERIAL.	Tonnage.	Brands.	MATERIAL.	Tonnage.	Brands.
Superphosphate . . .	5,276	18	Cotton hull ashes . . .	160	5
Nitrate of soda . . .	3,279	5	Stone meal . . .	125	—
Ground bone . . .	2,396	26	Linseed meal . . .	113	—
Cottonseed meal . . .	2,175	8	Sulfate of potash . . .	106	6
Pulverized animal manures . . .	1,634	29	Nitrate of potash . . .	96	7
Cyanamid . . .	1,082	—	Castor pomace . . .	80	8
Sulfate of ammonia . . .	909	14	Wood ashes . . .	80	—
Muriate of potash . . .	806	15	Double superphosphate . . .	48	—
Milorganite . . .	650	—	Ammo-Phos . . .	35	—
Animal tankage . . .	403	11	Calcium nitrate . . .	31	—
Nitrate of soda-potash . . .	308	—	Dried blood . . .	15	—
Basic slag phosphate . . .	270	—	Sulfate of potash-magnesia . . .	10	—
Peat . . .	243	—	Miscellaneous . . .	25	7
Dry ground fish . . .	229	11			
Cal-Nitro . . .	215	—	Totals . . .	20,799	198

## MIXED FERTILIZERS.

## Deficiency Statistics for Mixed Fertilizers.

MANUFACTURER.	NUMBER OF BRANDS.		NUMBER OF TESTS OR DETERMINATIONS.				
	Analyzed.	Approximately Equal to Guarantee in Commercial Valuation.	Totals. (a)	Not Exceeding $\frac{1}{4}$ Per Cent Below Guarantee.	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee.	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee.	More than $\frac{3}{4}$ Per Cent Below Guarantee.
Aeme Guano Co.	6	6	18	3	0	0	0
American Agricultural Chemical Co.	43	43	129	10	2	0	0
American Soda Products Co.	1	1	3	0	0	0	0
Apothecaries Hall Co.	15	15	45	1	0	0	0
Armour Fertilizer Works	23	23	69	2	2	2	0
Barrie Laboratories, Inc.	1	1	3	0	0	0	0
Bartlett Tree Expert Co.	1	1	3	0	0	0	0
Baugh & Sons Co.	8	8	24	1	2	0	0
Belmont Gardens	1	1	3	0	0	0	0
Berkshire Chemical Co.	12	12	36	2	3	1	0
Woodworth Bradley, Inc.	1	1	3	0	1	0	0
Joseph Breck & Sons Corp.	1	1	3	0	0	0	0
Clay & Son, Ltd.	1	1	3	0	0	0	0
Collins Seed Service Co.	3	3	9	0	0	0	0
Consolidated Rendering Co.	20	20	64	0	3	0	0
Davey Tree Expert Co.	1	1	3	0	0	0	0
Davison Chemical Corp.	2	2	6	1	0	0	0
Eastern States Farmers' Exchange	16	16	58	1	0	1	0
Thomas W. Emerson Co.	1	1	3	0	0	0	0
H. L. Frost & Higgins Co.	2	2	6	0	0	0	0
Goulard & Olen, Inc.	3	3	9	0	1	0	0
Thomas J. Grey Co.	1	1	3	0	0	0	0
Thomas Hersom & Co.	2	2	6	0	0	0	0
A. H. Hoffman, Inc.	1	1	3	0	0	0	0
International Agricultural Corp.	13	13	46	6	2	0	0
Lowell Fertilizer Co.	7	7	21	1	0	0	0
McClain Brothers Co.	1	1	3	0	0	1	0
Old Deerfield Fertilizer Co., Inc.	22	22	66	4	1	1	2
Olds & Whipple, Inc.	11	11	33	0	3	0	0
F. G. Phillips Co.	1	1	3	0	0	0	0
Plantabbs Corp.	1	1	3	0	0	0	0
Plantspur Products Co.	1	1	3	0	0	0	0
Rogers & Hubbard Co.	26	26	78	1	0	2	2
Salem Chemical & Supply Co.	1	1	3	0	0	0	0
O. M. Scott & Sons Co.	1	1	3	0	0	0	1
M. L. Shoemaker & Co.	1	1	2	1	0	0	0
Standard Wholesale Phosphate & Acid Works, Inc.	12	11	36	3	1	2	3
Stimulant Laboratories, Inc.	1	1	3	0	0	0	0
Swift & Co.	2	2	6	0	0	0	0
F. Sylvester & Son	1	1	3	0	0	0	0
Synthetic Nitrogen Products Corp.	1	1	3	0	0	0	0
Tennessee Corp.	2	2	6	0	0	0	0
Victory Products Co.	2	2	6	0	0	0	0
Virginia-Carolina Chemical Corp.	6	6	18	0	1	0	0
Vita-Vim Co.	1	1	3	0	0	0	0
C. P. Washburn Co.	3	3	9	0	1	0	0
E. E. Williams	1	1	3	0	0	0	1
Winslow Nurseries	1	1	3	0	0	1	1
Totals	285	284	875	37	23	11	10

a Several analyses of the same brand have been averaged and recorded in the table as one analysis. Analyses of fertilizer left over from previous year not included.

## Summary of Deficiencies in Mixed Fertilizers.

	1934.	1935.	1936.
Brands deficient in one element . . . . .	67	42	61
Brands deficient in two elements . . . . .	7	7	7
Brands deficient in three elements . . . . .	0	2	2
Brands deficient in nitrogen . . . . .	22	20	22
Brands deficient in available phosphoric acid . . . . .	22	22	33
Brands deficient in potash . . . . .	37	17	26
Brands deficient in magnesium oxide . . . . .	0	3	0

## Serious Commercial Shortages in Mixed Fertilizers.

AMOUNT OF SHORTAGE PER TON.	NUMBER OF BRANDS ACCORDING TO YEARS.			
	1933.	1934.	1935.	1936.
More than \$5 . . . . .	1	1	1	none
Between \$4 and \$5 . . . . .	none	none	none	none
Between \$3 and \$4 . . . . .	none	none	1	1
Between \$2 and \$3 . . . . .	2	none	none	none
Between \$1 and \$2 . . . . .	1	1	2	none

Of the 285 brands analyzed, 215, or 75 per cent, showed no deficiencies. Out of 875 plant food guarantees made, 91 per cent were fully maintained.

The deficiency table shows the following statistics:

Deficiencies not exceeding  $\frac{1}{4}$  of one per cent, 37.

Deficiencies between  $\frac{1}{4}$  and  $\frac{1}{2}$  of one per cent, 23.

Deficiencies between  $\frac{1}{2}$  and  $\frac{3}{4}$  of one per cent, 11.

Deficiencies more than  $\frac{3}{4}$  of one per cent, 10.

Of the total number of guarantees of each element made, 8 per cent of the nitrogen, 12 per cent of the available phosphoric acid, and 9 per cent of the potash were not met. Twelve of the 22 nitrogen deficiencies, 14 of the 33 available phosphoric acid deficiencies, and 11 of the 26 potash deficiencies did not exceed  $\frac{1}{4}$  of one per cent.

Compared with the 1935 inspection, there were 2 more shortages in nitrogen, 11 more in available phosphoric acid, and 9 more in potash.

In the case of those fertilizers which did not conform strictly to the guarantee, the discrepancies were of such a character as to make it evident that there was no intentional attempt at violation of the regulations.

Fifteen different firms have registered five or more brands of mixed fertilizers. On the basis of composition found by analysis as well as upon tonnage sold, the following table shows to what extent each manufacturer was successful in avoiding deficiencies in plant food guarantees in his mixtures. All but two of the fifteen firms provided a satisfactory average over-run in the three major plant food elements guaranteed.

Mixing Efficiency Table.

MANUFACTURER.	AVERAGE PERCENTAGE OF PLANT FOOD ABOVE OR BELOW THE MINIMUM GUARANTEE.		
	Nitrogen.	Available Phosphoric Acid.	Potash.
Acme Guano Co. . . . .	+ .14	+ .50	+ .16
American Agricultural Chemical Co. . . . .	+ .12	+ .39	+ .21
Apothecaries Hall Co. . . . .	+ .43	+ .97	+ .41
Armour Fertilizer Works . . . . .	+ .17	+ .33	+ .36
Baugh & Sons Co. . . . .	+ .07	+ .26	+ .24
Berkshire Chemical Co. . . . .	+ .11	+ .20	+ .28
Consolidated Rendering Co. . . . .	+ .27	+ .49	+ .13
Eastern States Farmers' Exchange . . . . .	+ .40	+ .18	+ .86
International Agricultural Corp. . . . .	+ .14	- .03	+ .29
Lowell Fertilizer Co. . . . .	+ .29	+ .23	+ .45
Old Deerfield Fertilizer Co., Inc. . . . .	+ .20	+ .55	+ .60
Olds & Whipple, Inc. . . . .	+ .15	+ .31	+ .47
Rogers & Hubbard Co. . . . .	+ .26	+ .51	+ .44
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	+ .19	+ .23	+ .33
Virginia-Carolina Chemical Corp. . . . .	+ .05	+ .72	+ .51

Summary of Data on Acid and Basic Fertilizers.

FERTILIZER TONNAGE TESTED.				EXTENT OF ACIDITY OR BASICITY ON FERTILIZER TONNAGE SOLD, RESULTS EXPRESSED IN TONS OF CALCIUM CARBONATE (CaCO <sub>3</sub> ).			
	1934.	1935.	1936.		1934.	1935.	1936.
Acid . . . . .	35,205	35,715	34,746	Acidity . . . . .	4,812	3,840	3,826
Basic . . . . .	4,523	6,967	8,393	Basicity . . . . .	149	445	571
Total . . . . .	39,728	42,682	43,139	Net acidity . . . . .	4,663	3,395	3,255

AVERAGE ANALYSIS OF MIXED FERTILIZERS.\*

	1934.	1935.		1936.	
	Found.	Guaranteed.	Found.	Guaranteed.	Found.
Nitrogen . . . . .	5.08	4.82	5.26	4.98	5.18
Available phosphoric acid . . . . .	8.61	8.04	8.90	8.26	8.63
Potash . . . . .	6.89	6.59	7.19	6.82	7.17

\* Does not include fertilizers mixed for special orders.

Although there was a greater tonnage of double- and multiple-strength fertilizers sold in 1936 than in the preceding year, the average analysis found is lower than in 1935. This is due to the fact that the manufacturers allowed a much more liberal average over-run in all three plant foods in 1935 than in 1936. Therefore, while the guaranteed average analysis for 1936 is higher, the actual average analysis is lower than for 1935. The above table shows that the trend continues toward the manufacture of higher grade fertilizers.

### Explanation of Tables of Analyses.

**Guarantee.** The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer, Brand and Grade," and is expressed as nitrogen, available phosphoric acid and water soluble potash and in that order.

**Commercial Shortages.** In the table designated "Mixtures showing a commercial shortage of \$1 or more per ton," the column headed "Approximate commercial valuation per ton" gives the sum of the valuation of each plant food element computed from the analysis by use of the trade values adopted by the Massachusetts Fertilizer Control for 1936, which appear on a preceding page of the bulletin.

Under the heading "Approximate commercial shortage per ton" is shown the commercial valuation of the deficiencies or tests found below the guarantee after allowance is made for the value of overruns or tests above the guarantee.

Deficiencies are emphasized by boldface type.

**Mixtures Substantially Complying with the Guarantee.** In addition to the analysis of those fertilizers substantially complying with the guarantee, this table includes also those mixtures that are more or less out of balance; that is, having deficiencies in one or more plant food elements, but having overruns which largely offset the value of the deficiencies.

"Number of samples" indicates the number of samples included in the composite which was analyzed.

**Inferior Nitrogen.** The presence of inferior forms of organic nitrogen is indicated by footnotes.

**Potash Forms.** Wherever tests for chlorine showed a sufficient amount present to unite with all of the potash found, the source of the potash is designated as muriate. Wherever insufficient chlorine was found to account for all of the potash it is evident that forms of potash other than muriate were used. In such cases, the figures under the sub-heading "As muriate" do not imply necessarily that muriate of potash was actually added to the mixture, but that chlorine was present, probably from impurities in the fertilizer chemicals, in amounts to account for the percentage of potash indicated. The balance of the potash found is listed under the sub-heading "In forms other than muriate" and may be derived from sulfate, nitrate, or carbonate, as the case may be.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton.

NAME OF MANUFACTURER AND BRAND.	Where Sampled.	Approximate Commercial Valuation Per Ton.	Approximate Commercial Shortage Per Ton.	NITROGEN FOUND.				PHOSPHORIC ACID FOUND.		POTASH (K <sub>2</sub> O) FOUND.	
				In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.	Avail-able.	Total.	As Muriate.	In Forms Other than Muriate.
Standard Wholesale Phosphate & Acid Works, Inc. Standard 8-16-20	Amesbury	\$38.72	\$3.46	5.32	.53	1.09	6.94	15.12	15.63	18.72	-



## Mixtures Substantially Complying with Guarantees.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Acme Guano Co.								
1	Acme 3-10-4	2.26	-	.50	2.76	10.03	4.07	-
1	Acme 4-6-10	3.58	.21	.51	4.30	8.32	9.89	-
1	Acme 4-8-6	3.28	.40	.68	4.36	8.04	6.03	-
2	Acme 5-8-7	4.60	.29	.43	5.32	8.21	6.96	-
2	Acme 4-8-4 Sergeant's Mixture	3.28	.21	.59	4.08	8.16	2.63	1.40
1	Acme 4-8-7 Sergeant's Mixture	3.28	.26	.59	4.13	8.52	7.17	-
American Agricultural Chemical Co.								
3	AA Complete Manure with 10% Potash 4-8-10	2.80	.28	1.00	4.08	8.22	10.12	-
1	AA Complete Manure with 10% Potash 4-8-10	2.94	-	1.10	4.04	8.49	10.12	-
3	AA Corn Favorite 3-10-4	2.06	.14	.95	3.15	10.51	4.03	-
4	AA Corn Favorite 3-10-4	2.28	.36	.91	3.55	10.02	4.46	-
3	AA Cranberry Fertilizer 5-6-4	3.72	.59	.69	5.00	6.09	4.03	-
1	AA Cranberry Fertilizer 5-6-4	3.74	.58	.63	4.95	6.07	4.01	-
4	AA Double Strength Fertilizer 8-16-14	6.68	.92	.32	7.92	16.13	14.42	-
1	AA Double Strength Fertilizer 8-16-14	6.82	.66	.58	8.06	16.15	13.73	-
2	AA Double Strength Fertilizer with 20% Potash 8-16-20	6.82	1.10	.22	8.14	16.79	20.43	-
1	AA Double Strength Fertilizer with 20% Potash 8-16-20	6.58	1.25	.27	8.10	16.02	20.08	-
3	AA Monarch Fertilizer 4-8-4	2.66	.38	1.00	4.04	8.01	4.01	-
6	AA Monarch Fertilizer 4-8-4	2.86	.42	.99	4.27	8.36	4.01	-
2	AA Peerless Fertilizer 4-8-7	2.84	.61	.61	4.06	8.17	7.42	-

## INSPECTION OF COMMERCIAL FERTILIZERS

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2	AA Potato Grower 5-8-10	.	.	.	.	.	.	3.44	.77	.68	4.89	8.47	9.80
4	AA Potato Grower 5-8-10	.	.	.	.	.	.	3.24	1.03	.88	5.15	8.47	9.46
4	AA Potato & Vegetable Fertilizer 5-8-7	.	.	.	.	.	.	3.64	.41	1.11	5.16	8.24	7.29
4	AA Potato & Vegetable Fertilizer 5-8-7	.	.	.	.	.	.	3.58	.33	1.13	5.04	8.42	7.36
3	AA Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	1.36	.13	.81	2.30	8.55	10.02
4	AA Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	1.60	—	.80	2.40	8.24	9.66
2	AA Tobacco Starter 5-5-15	.	.	.	.	.	.	2.80	.84	1.75	5.39	5.92	14.96
3	AA Top Dresser 7-6-6	.	.	.	.	.	.	5.96	.56	.78	7.30	6.20	6.57
5	AA Top Dresser 7-6-6	.	.	.	.	.	.	5.48	.97	.62	7.07	6.40	6.09
3	Agrico for Aroostook with 10% Potash 5-8-10	.	.	.	.	.	.	3.36	.94	.79	5.09	8.24	10.25
6	Agrico for Aroostook with 10% Potash 5-8-10	.	.	.	.	.	.	3.48	.53	.99	5.00	8.09	10.35
5	Agrico for Corn 3-10-6	.	.	.	.	.	.	2.24	.46	.50	3.20	10.46	6.78
4	Agrico for Corn 3-10-6	.	.	.	.	.	.	2.16	—	.88	3.04	10.59	6.32
3	Agrico for Fruit 9-6-6	.	.	.	.	.	.	7.44	.99	.67	9.10	6.25	6.24
1	Agrico for Fruit 9-6-6	.	.	.	.	.	.	7.84	.89	.59	9.32	6.05	6.26
2	Agrico for Gardens 5-8-7	.	.	.	.	.	.	3.62	.60	.83	5.05	8.57	7.17
1	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	5.32	.70	1.00	7.02	6.22	6.01
3	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	5.46	.95	.67	7.08	6.04	6.34
3	Agrico for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	5.46	.82	.75	7.03	6.37	6.01
4	Agrico for New England 4-8-10	.	.	.	.	.	.	2.28	.74	.99	4.01	8.55	9.96
4	Agrico for New England 4-8-10	.	.	.	.	.	.	2.56	.60	1.01	4.17	8.64	10.00
3	Agrico for Onions 5-10-5	.	.	.	.	.	.	3.08	.93	1.11	5.12	10.69	5.14
4	Agrico for Onions 5-10-5	.	.	.	.	.	.	3.04	1.02	1.03	5.09	10.36	5.19
4	Agrico for Pastures and Top Dressing 7-6-6	.	.	.	.	.	.	5.76	1.23	.34	7.33	5.81	6.04
4	Agrico for Pastures and Top Dressing 7-6-6	.	.	.	.	.	.	5.28	1.06	.72	7.06	6.15	6.01
5	Agrico for Potatoes Double Strength 8-16-14	.	.	.	.	.	.	6.50	.78	.79	8.07	16.50	14.78
2	Agrico for Potatoes Double Strength 8-16-14	.	.	.	.	.	.	6.54	1.02	.58	8.14	16.03	14.22
3	Agrico for Potatoes Double Strength 8-16-20	.	.	.	.	.	.	6.88	.71	.58	8.17	16.71	20.32
5	Agrico for Potatoes and Vegetables 5-8-7	.	.	.	.	.	.	3.50	.52	1.05	5.07	8.67	7.29
3	Agrico for Potatoes and Vegetables 5-8-7	.	.	.	.	.	.	3.52	.77	.78	5.07	8.65	7.02
2	Agrico for Tobacco 6-3-6	.	.	.	.	.	.	1.54	.69	4.05	6.28	3.06	—
1	Agrico for Tobacco 6-3-6	.	.	.	.	.	.	1.58	.57	4.28	6.43	3.13	—
3	Bowler's All Round Fertilizer 3-10-4	.	.	.	.	.	.	2.18	.32	.93	3.43	10.08	3.91
4	Bowler's All Round Fertilizer 3-10-4	.	.	.	.	.	.	2.34	—	.80	3.14	11.07	4.11

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
American Agricultural Chemical Co. — concluded.								
3	Bowler's Market Garden Fertilizer 4-8-4 . . . . .	2.82	.24	1.03	4.09	8.57	4.01	—
3	Bowler's Market Garden Fertilizer 4-8-4 . . . . .	2.92	.24	.92	4.08	8.57	4.03	—
3	Bowler's Stockbridge Early Crop Manure 5-8-7 . . . . .	3.46	.68	1.09	5.23	8.70	6.65	.44
3	Bowler's Stockbridge Early Crop Manure 5-8-7 . . . . .	3.86	.34	1.03	5.23	8.29	7.09	—
3	Bowler's Stockbridge Potato and Vegetable Manure 4-8-10 . . . . .	2.88	.36	.80	4.04	8.75	9.56	—
3	Bowler's Stockbridge Potato and Vegetable Manure 4-8-10 . . . . .	2.88	.36	.93	4.17	8.31	10.00	—
1	Bowler's Stockbridge Truck Manure 4-8-7 . . . . .	2.86	.15	1.03	4.04	8.04	7.36	—
3	Bradley's Blood, Bone and Potash Brand 5-8-7 . . . . .	3.40	.34	1.35	5.09	8.67	6.61	.64
3	Bradley's Blood, Bone and Potash Brand 5-8-7 . . . . .	3.52	.57	.99	5.08	8.29	7.33	—
4	Bradley's Complete Manure for Potatoes and Vegetables 4-8-7 . . . . .	2.70	.42	.96	4.08	8.29	7.05	—
3	Bradley's Complete Manure for Potatoes and Vegetables 4-8-7 . . . . .	2.86	.53	1.03	4.42	8.37	7.42	—
3	Bradley's Complete Manure with 10% Potash 4-8-10 . . . . .	2.88	.54	.73	4.15	8.47	9.86	—
3	Bradley's Complete Manure with 10% Potash 4-8-10 . . . . .	2.76	.56	.93	4.25	8.11	9.64	—
4	Bradley's Northland Fertilizer 4-8-4 . . . . .	2.74	.34	.94	4.02	8.24	4.28	—
1	Bradley's Northland Fertilizer 4-8-4 . . . . .	2.70	.57	.96	4.23	8.47	4.07	—
5	Bradley's XL Fertilizer 3-10-4 . . . . .	2.06	.13	.91	3.10	10.74	3.84	—
3	Bradley's XL Fertilizer 3-10-4 . . . . .	2.06	.32	.91	3.29	10.28	4.42	—
1	Co-op 4-8-4 Fertilizer . . . . .	2.68	.47	.95	4.10	8.06	4.19	—
1	Co-op 4-8-7 Fertilizer . . . . .	2.86	.49	.97	4.32	8.33	7.05	—
3	Co-op 5-8-7 Fertilizer . . . . .	3.44	.63	.98	5.05	8.29	7.06	.30
5	Co-op 5-8-7 Fertilizer . . . . .	3.70	.54	.83	5.07	7.82	7.21	—
3	Co-op 7-6-6 Fertilizer . . . . .	4.90	1.45	.74	7.09	6.31	5.79	.28
2	Co-op 7-6-6 Fertilizer . . . . .	5.34	1.00	.72	7.06	6.13	6.20	—

1	Double A Tobacco Fertilizer 5-3-5	.	.	.	.	.	1.34	.70	3.42	5.46	3.09	-	5.00
1	National Pine Tree Brand 4-8-4	.	.	.	.	.	2.54	.37	1.07	3.98	7.83	3.86	-
3	Netco Greens Formula 8-6-2	.	.	.	.	.	5.26	.13	2.96	8.35	6.03	2.02	-
1	Netco Greens Formula 8-6-2	.	.	.	.	.	6.14	.23	2.47	8.84	6.22	.91	.89
2	Sanderson's Formula A 4-8-4	.	.	.	.	.	2.82	.57	.73	4.12	8.50	4.19	-
2	Sanderson's Formula B 4-8-7	.	.	.	.	.	2.68	.33	.99	4.00	8.09	-	7.15
4	American Soda Products Co. Grogreen Fern Food 3-8-3	.	.	.	.	.	2.80	.18	1.92	4.90	9.31	-	3.26
2	Apothecaries Hall Co. Liberty Corn 2-10-2	.	.	.	.	.	1.20	.22	1.20	2.62	10.21	4.55	-
2	Liberty High Grade Corn 2-12-4	.	.	.	.	.	1.48	-	1.27	2.75	12.38	4.57	-
4	Liberty High Grade Market Gardeners 5-8-7	.	.	.	.	.	2.28	1.89	1.23	5.40	8.70	7.21	-
2	Liberty High Grade Market Gardeners (Special Formula) 5-8-7	.	.	.	.	.	2.34	1.80	1.27	5.41	9.54	7.40	-
1	Liberty High Grade Tobacco Manure 6-3-7	.	.	.	.	.	.24	1.53	4.70	6.47	4.98	-	7.77
3	Liberty Market Gardeners Special 4-8-4	.	.	.	.	.	2.28	.95	1.16	4.39	9.09	4.65	-
1	Liberty Market Gardeners Special 4-8-4	.	.	.	.	.	2.32	1.16	1.02	4.50	8.98	4.19	-
2	Liberty Union Special (Potash as Sulphate) 4-8-7	.	.	.	.	.	1.06	2.03	1.47	4.56	11.44	-	7.29
5	Liberty Potato and General Crops 4-8-10	.	.	.	.	.	2.80	.84	.79	4.43	8.68	10.56	-
3	Liberty Potato and Market Gardeners (Potash as Muriate) 4-8-7	.	.	.	.	.	2.66	.93	.82	4.41	8.70	7.38	-
1	Liberty Potato and Vegetable 2-8-10	.	.	.	.	.	1.12	.06	1.59	2.77	8.68	10.02	-
1	Liberty Special for Fruit 7-8-6	.	.	.	.	.	2.74	3.61	.77	7.12	8.29	5.85	-
1	Liberty Tobacco Fertilizer 6-3-6	.	.	.	.	.	.32	.54	5.33	6.19	4.77	-	7.62
1	Liberty Tobacco Special 5-3-5	.	.	.	.	.	.10	.39	5.09	5.58	4.80	-	5.87
2	Liberty Top Dresser for Grass and Grain 8-8-8	.	.	.	.	.	6.00	2.04	.60	8.64	8.24	8.99	-
1	Liberty Tree and Shrub Food 10-8-8	.	.	.	.	.	8.76	1.60	.50	10.86	8.50	9.49	-

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Armour Fertilizer Works								
2	Armours Big Crop Fertilizer 2-10-2	1.38	.25	.68	2.31	9.98	2.91	-
1	Armours Big Crop Fertilizer 3-10-4	2.34	.55	.49	3.38	10.23	4.07	-
3	Armours Big Crop Fertilizer 3-12-6	1.98	.64	.63	3.25	11.86	6.14	-
1	Armours Big Crop Fertilizer 2-12-4	1.34	.54	.50	2.38	12.52	4.05	-
4	Armours Big Crop Fertilizer 4-8-4	2.84	.49	.76	4.09	8.35	4.32	-
4	Armours Big Crop Fertilizer 4-8-4	2.70	.70	.89	4.29	8.50	4.03	-
3	Armours Big Crop Fertilizer 4-8-7	2.14	.78	1.24	4.16	8.01	7.23	-
2	Armours Big Crop Fertilizer 4-8-7	2.36	.93	.90	4.19	8.14	7.06	-
3	Armours Big Crop Fertilizer 4-8-8	2.32	.96	.95	4.23	8.07	8.39	-
1	Armours Big Crop Fertilizer 4-8-8	2.42	.76	1.12	4.30	8.24	8.90	-
4	Armours Big Crop Fertilizer 4-8-10	2.42	.89	1.03	4.34	8.12	10.02	-
2	Armours Big Crop Fertilizer 4-8-10	2.54	.89	.94	4.37	8.16	10.43	-
2	Armours Big Crop Fertilizer 4-12-4	2.80	.73	.63	4.16	12.01	4.13	-
3	Armours Big Crop Fertilizer 4-16-4	3.36	.47	.33	4.16	16.07	4.11	-
5	Armours Big Crop Fertilizer 5-8-7	3.12	1.01	1.03	5.16	8.21	7.34	-
3	Armours Big Crop Fertilizer 5-8-7	3.28	1.11	1.00	5.39	8.37	7.25	-
3	Armours Big Crop Fertilizer 5-8-10	3.40	1.24	.77	5.41	8.37	10.62	-
1	Armours Big Crop Fertilizer 6-11-10	4.94	.84	.36	6.14	10.57	10.27	-
3	Armours Big Crop Fertilizer 7-6-6	5.82	.62	.85	7.29	6.07	6.20	-
1	Armours Big Crop Fertilizer 7-6-6	5.04	.61	1.15	6.80	6.97	6.59	-
1	Armours Big Crop Fertilizer 8-16-14	6.48	1.14	.39	8.01	16.94	15.74	-

1	Armours Big Crop Fertilizer 8-16-16	6.42	.84	.17	7.43	15.31	17.17
2	Armours Big Crop 8-16-20	6.80	1.30	.14	8.24	15.59	21.06
1	Armours Big Crop Orchard Special 7-8-6	4.26	2.09	1.12	7.47	8.44	6.44
1	Armours Big Crop Tobacco Special 5-3-5	.16	2.11	3.00	5.27	3.88	5.50
2	Armours Big Crop Tobacco Special 6-3-6	.22	1.20	4.81	6.23	3.83	6.97
1	Armours Big Crop Tobacco Starter 5-5-15	.24	4.01 *	1.03	5.28	5.41	15.12
1	Armours Special Turf Fertilizer 10-8-6	9.12	.93	.07	10.12	8.42	2.77
3	Armours Vert Plant Food 5-8-6	4.44	.49	.22	5.15	8.85	-
<b>Barrie Laboratories, Inc.</b>							
3	Barrie's Plant Food 6-4-6	.22	1.19	6.28	7.69	7.47	5.21
<b>F. A. Bartlett Tree Expert Co.</b>							
2	Bartlett Green Tree Food 6-7-4	5.12	.26	1.28	6.66	7.86	-
<b>Baugh &amp; Sons Co.</b>							
1	Baugh's Animal Base and Potash Compound 2-10-2	1.32	.30	.73	2.35	10.62	-
1	Baugh's Complete Animal Base Fertilizer 3-8-4	1.86	.69	1.05	3.60	8.70	-
1	Baugh's Fish Bone and Potash Brand 4-8-4	2.20	.63	1.27	4.10	8.44	-
1	Baugh's Half Century Perfection Brand 4-8-7	2.08	1.03	1.12	4.23	8.70	7.02
1	Baugh's Peruvian Guano Substitute 5-8-7	2.80	.97	1.16	4.93	8.07	-
1	Baugh's Special Top Dresser 7-6-6	4.52	.95	1.86	7.33	6.64	-
1	Baugh's Three-Quarter Century Perfection Brand 3-10-6	1.60	.75	.94	3.29	9.69	-
1	Baugh's Trucker's Favorite 5-10-5	2.66	.64	1.84	5.14	10.15	5.74
<b>Belmont Gardens</b>							
1	Belgard Plant Food 6-15-4	5.46	.40	.86	6.72	16.53	-

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		MAGNESIUM OXIDE.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	Found.	Guaranteed.	
Berkshire Chemical Co.											
1	Berkshire Complete Fertilizer 2-12-2	1.36	.17	.79	2.32	11.99	2.09	-			
1	Berkshire Complete Tobacco Fertilizer 5-3-5	.10	.52	4.08	4.70	3.01	-	5.72			
1	Berkshire Double Strength Fertilizer 8-16-14	6.08	2.16	.56	8.80	15.36	14.22	-			
1	Berkshire Economical Grass Fertilizer 8-5-8	3.42	3.77	.94	8.13	6.40	7.70	-			
3	Berkshire Grass Special Fertilizer 6-6-5	4.74	.50	.95	6.19	6.50	5.76	-			
1	Berkshire High Grade Tobacco Fertilizer 6-3-6	.32	1.42	4.29	6.03	4.79	-	6.86			
3	Berkshire Long Island Special Fertilizer 4-8-7	2.38	.43	1.32	4.13	8.29	7.60	-			
1	Berkshire Long Island Special Fertilizer 4-8-7	2.58	.69	.87	4.14	8.01	7.17	-			
3	Berkshire Market Garden Fertilizer 4-8-4	2.56	.47	.99	4.02	8.21	4.09	-			
3	Berkshire Onion Special Fertilizer 4-10-4	2.60	.55	1.08	4.23	9.63	4.15	-			
3	Berkshire Potato and Garden Special Fertilizer 5-8-7	2.88	.64	1.57	5.09	8.16	7.29	-			
2	Berkshire Potato and Garden Special Fertilizer 5-8-7	3.08	.94	1.08	5.10	8.19	7.02	-			
2	Berkshire Tobacco Starter Fertilizer 5-5-15	.14	3.29	1.76	5.19	6.15	-	16.09			
1	Berkshire Truck Fertilizer 4-8-5	2.66	.31	1.05	4.02	7.78	5.81	-			
Woodworth Bradley, Inc.											
1	Goleco 8-6-4	5.68	1.09	.92	7.69	6.20	4.03	-			

Joseph Breck & Sons Corp.									
1	Breck's Home Garden Fertilizer 5-10-10	1.54	1.89	1.62	5.05	10.25	1.97	8.13	
1	Breck's Home Garden Fertilizer 5-10-10	1.46	2.24	1.64	5.34	10.48	5.30	4.78	
Clay & Son, Ltd.									
4	Clay's Fertilizer 5-9-2	2.50	.07	3.00	5.57	9.69	-	2.40	
Collins Seed Service Co.									
1	Casta-Poma Grass Manure 5-6-2	2.82	.81	2.20	5.83	6.05	2.38	-	
1	Casta-Poma Grass Manure 5-6-2	2.22	.58	2.23	5.03	6.63	2.11	-	
1	Complete Grass Manure 6-8-2	2.56	1.08	2.70	6.34	8.22	2.83	-	
1	Ver-Best Putting Green Manure 7-8-3	3.62	.90	2.74	7.26	8.03	3.45	-	
Consolidated Rendering Co.									
4	Corenco 3-10-4 Animal Brand	1.16	1.53	.31	3.00	10.13	4.26	-	
5	Corenco 3-10-4 Animal Brand	1.16	1.14	.96	3.26	10.08	4.07	-	
3	Corenco 4-8-4 Corn and Vegetable	2.04	1.15	1.03	4.22	8.42	4.22	-	
7	Corenco 4-8-4 Corn and Vegetable	2.08	1.13	.97	4.18	8.52	4.11	-	
2	Corenco 4-8-7 Market Garden	1.92	.76	1.37	4.05	8.42	7.21	-	
4	Corenco 4-8-7 Market Garden	2.08	1.16	.97	4.21	8.54	7.02	-	
2	Corenco 4-8-10 Potato Grower	2.12	1.23	.95	4.30	8.57	10.12	-	
7	Corenco 4-8-10 Potato Grower	2.02	1.44	1.04	4.50	8.49	10.00	-	
1	Corenco 4-8-10 Made with Water Soluble Magnesium	2.74	.92	.53	4.19	8.32	10.35	1.64	1.00
3	Corenco 4-12-4 Complete Manure	2.08	1.07	.89	4.04	12.40	4.46	-	
1	Corenco 4-12-4 Complete Manure	2.12	1.32	.91	4.35	12.61	4.17	-	
1	Corenco 5-5-5 Lawn and Shrub Fertilizer	2.18	.22	2.92	5.32	6.29	5.33	-	
4	Corenco 5-8-7 General Crop Manure	3.18	.42	1.68	5.28	8.59	7.13	-	
5	Corenco 5-8-7 General Crop Manure	2.90	1.39	1.07	5.36	8.49	7.13	-	
2	Corenco 5-8-7 Made with Water Soluble Magnesium	3.20	.93	.97	5.10	8.47	7.68	1.14	1.00
3	Corenco 5-8-10 Peerless Potato	3.08	1.22	.84	5.14	8.67	9.63	-	
1	Corenco 5-8-10 Peerless Potato	3.14	.87	1.16	5.17	8.60	10.00	-	
1	Corenco 5-8-10 with Water Soluble Magnesium	3.04	1.00	.96	5.00	8.27	9.61	1.06	1.00



Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		MAGNESIUM OXIDE.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	Found.	Guaranteed.
Consolidated Rendering Co. — concluded.										
2	Corenco 5-9-8 . . . . .	2.34	.78	1.91	5.03	9.33	8.00	—		
1	Corenco 6-3-6 Special Tobacco Grower .	.40	1.35	4.29	6.04	4.90	—	6.59		
1	Corenco 7-3-7 Super Tobacco Grower .	.18	1.41	5.58	7.17	4.44	—	8.36		
2	Corenco 7-6-6 Complete Fruit and Top Dressing . . . . .	4.42	1.86	1.29	7.57	6.66	5.95	—		
6	Corenco 7-6-6 Complete Fruit and Top Dressing . . . . .	4.94	1.34	1.01	7.29	6.04	6.12	—		
2	Corenco 7-13-11 "It Cuts the Cost" . .	4.26	1.60	1.23	7.09	12.60	11.51	—		
1	Corenco 8-6-4 Top Dressing . . . . .	5.94	1.29	.90	8.13	6.35	4.36	—		
2	Corenco 8-16-14 Two in One . . . . .	5.88	1.17	1.15	8.20	16.40	14.50	—		
1	Corenco 8-16-14 Two in One . . . . .	6.00	1.44	1.03	8.47	16.10	14.65	—		
1	Corenco 8-16-14 Two in One Made with Water Soluble Magnesium . . . . .	5.34	1.65	1.43	8.42	16.38	14.03	—	2.35	2.00
3	New England 8-6-2 Putting Green Special .	5.42	.38	2.61	8.41	7.45	2.81	—		
1	New England 8-6-2 Putting Green Special .	4.16	.24	4.31	8.71	6.89	2.48	—		
Davey Tree Expert Co.										
1	Davey Tree Food 10-3-3 . . . . .	6.32	1.57	2.17	10.06	3.37	3.51	—		
Davison Chemical Corp.										
1	Davco Homogeneous Granulated Fertilizer 4-8-4 . . . . .	3.20	.16	.48	3.84	9.63	5.02	—		
1	Davco Homogeneous Granulated Fertilizer 5-8-7 . . . . .	4.36	.23	.41	5.00	8.16	7.11	—		

## Eastern States Farmers' Exchange

3	Eastern States 0-14-6	-	-	-	14.92	6.24	-	3.64	3.50
4	Eastern States 0-14-6	-	-	-	14.31	6.82	-	3.59	3.50
3	Eastern States 4-8-8	2.88	1.07	.44	8.09	8.57	-	3.98	3.00
4	Eastern States 4-8-8	3.02	.95	.45	8.47	5.42	3.55	3.66	3.00
2	Eastern States 4-8-8	2.90	1.00	.45	8.36	8.37	-	3.91	3.00
3	Eastern States 4-12-4	2.90	.82	.71	12.68	4.79	-	2.43	2.00
5	Eastern States 4-12-4	3.02	.98	.49	12.17	2.63	1.67	2.20	2.00
3	Eastern States 4-16-20	2.96	1.02	.42	16.69	20.97	-	2.03	1.90
2	Eastern States 4-16-20	2.84	1.15	.53	17.89	19.04	-	2.25	1.90
1	Eastern States 5-5-15 Tobacco	-	2.87	3.06	5.97	-	16.44	-	-
2	Eastern States 6-3-6 Cranberry	.22	6.71	.38	4.26	-	7.82	-	-
3	Eastern States 6-8-6	4.20	2.05	.30	8.45	6.88	-	3.22	3.20
6	Eastern States 6-8-6	4.06	1.81	.54	8.42	3.61	3.21	3.29	3.20
1	Eastern States 6-8-6	3.96	2.07	.55	8.22	6.84	-	3.62	3.20
1	Eastern States 8-4-8 Tobacco	.46	2.53	5.84	5.33	-	9.22	-	-
1	Eastern States 8-12-20	5.52	1.90	.81	12.67	21.84	-	2.12	1.60
1	Eastern States 8-16-16	5.90	1.94	.21	15.36	9.53	8.41	1.92	1.60
3	Eastern States 8-16-16	5.98	2.27	.20	15.17	14.70	2.78	1.83	1.60
5	Eastern States 8-16-16	5.90	1.92	.41	15.66	17.27	-	1.84	1.60
1	Eastern States 8-16-16 Low Chlorine Special	5.46	2.17	.57	15.82	-	17.47	-	-
4	Eastern States 8-20-12	5.28	2.35	.55	20.02	13.02	-	1.95	1.60
1	Eastern States 8-24-8	5.12	2.64	.43	24.03	9.69	-	1.94	1.60
3	Eastern States 8-24-8	4.84	3.23	.29	24.03	8.91	-	1.92	1.60
4	Eastern States 8-24-8	5.18	2.89	.45	25.10	8.33	-	1.89	1.60
3	Eastern States 10-5-10 Tobacco	.56	3.10	7.11	5.20	-	11.64	-	-
3	Eastern States 12-4-4	7.98	4.56	.36	4.52	3.94	.83	3.33	3.50
2	Eastern States 12-4-4	7.82	4.08	.50	4.34	4.01	-	3.88	3.50
1	Eastern States 12-16-12	7.98	4.25	.51	16.11	-	13.95	2.01	1.60
3	Eastern States 12-16-12	7.50	4.11	.61	16.07	-	12.83	1.85	1.60
4	Eastern States 12-16-12	7.74	3.99	.45	16.04	-	12.80	1.93	1.60

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		MAGNESIUM OXIDE.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	Found.	Guaranteed.	
Thomas W. Emerson Co.											
3	Emerson's "English Formula" Lawn and Garden Dressing 5-7-3 . . . . .	3.22	.13	2.11	5.46	7.02	3.30	-			
Excell Laboratories											
1	Zenke's New Plant Life (1.4-1.07-.54) (old stock) . . . . .	.76	.80	-	1.56	.37	-	1.43			
Ferti-Lawn Co., Inc.											
1	Ferti-Lawn 4-7-3 . . . . .	3.96	.56	1.32	5.84	9.10	4.90	-			
Flower City Plant Food Co., Inc.											
1	Wondergro Plant Food 10-12-11 . . . . .	11.54	.43	.02	11.99	16.46	15.33	-			
H. L. Frost & Higgins Co.											
1	Frost's Lawn and Shrubby Special 8-6-3 . . . . .	2.28	2.03	4.01	8.32	6.69	3.88	-			
1	Frost's Lawn and Shrubby Special 8-6-3 . . . . .	2.16	1.71	4.13	8.00	7.19	3.94	-			
1	Frost's Shade Tree Special 10-6-6 . . . . .	7.96	.49	2.30	10.75	6.12	6.72	-			
Goulard & Olena, Inc.											
1	G & O Lawn Garden and Flower Fertilizer 5-8-5 . . . . .	2.36	1.60	1.26	5.22	8.83	5.21	-			
1	G & O Lawn Garden and Flower Fertilizer (4.12-8-5) (old stock) . . . . .	3.22	.32	.92	4.46	9.24	5.43	-			
1	G & O Plant Food 11-15-20 . . . . .	9.36	.74	2.50	12.60	14.56	20.06	-			
1	Van Horne's Lawn and Garden Grower 5-8-5 . . . . .	2.96	.47	1.64	5.07	9.13	5.66	-			
1	Sears Lawn and Garden Grower 5-8-5 . . . . .	3.30	.58	1.42	5.30	9.64	5.31	-			

Thomas J. Grey Co.									
1	Grey's 9-6-6 Plant Food . . . . .	7.92	.69	.46	9.07	6.04	6.55	-	
Thomas Hersom & Co.									
1	Neverfail 4-8-4 . . . . .	1.88	1.17	1.08	4.13	8.11	4.34	-	
2	Neverfail 5-8-7 . . . . .	3.06	1.15	.96	5.17	8.08	7.44	-	
A. H. Hoffman, Inc.									
2	Hoffman's Plant Food 5-8-6 . . . . .	2.14	1.63	1.62	5.39	10.64	-	6.24	
International Agricultural Corp.									
4	International 3-10-4 . . . . .	1.82	.09	1.42	3.33	10.23	4.15	-	
3	International 3-10-4 . . . . .	1.72	.99	.63	3.34	10.11	3.66	-	
1	International 3-10-4 . . . . .	1.80	1.01	.59	3.40	10.51	4.22	-	
5	International 4-8-4 . . . . .	2.68	.82	.69	4.19	8.01	4.11	-	
4	International 4-8-4 . . . . .	2.70	1.00	.74	4.44	8.16	4.71	-	
2	International 4-8-7 . . . . .	2.62	.69	.77	4.03	8.06	7.15	1.35	1.00
2	International 4-8-8 . . . . .	2.62	.89	.61	4.12	7.52	8.00	-	
3	International 4-8-10 . . . . .	2.90	.79	.44	4.13	7.86	10.62	-	1.36
6	International 4-8-10 . . . . .	2.68	.85	.55	4.08	7.78	10.16	-	1.00
1	International 4-8-10 . . . . .	2.94	.54	.54	4.02	8.24	8.90	-	1.06
6	International 5-8-7 . . . . .	3.24	1.38	.44	5.03	7.71	7.27	-	
2	International 5-8-7 . . . . .	3.44	.95	.69	5.03	8.11	7.46	-	
5	International 7-6-6 . . . . .	5.14	.99	.98	7.11	6.35	6.18	-	
3	International 7-6-6 . . . . .	4.98	1.35	.93	7.26	6.56	6.01	-	
3	International 8-16-14 . . . . .	6.68	1.16	.39	8.23	16.02	9.69	4.77	2.37
3	International 8-16-14 . . . . .	6.54	1.20	.51	8.25	16.07	14.88	-	2.00
1	International 8-16-16 . . . . .	6.62	1.17	.45	8.24	16.07	16.13	-	
Caribee Tobacco Starter with 2% Magnesium Oxide 5-8-16 . . . . .									
1	Caribee Tobacco Starter with 2% Magnesium Oxide 5-8-16 . . . . .	.38	2.90	1.96	5.24	7.78	-	15.86	2.00
3	International Caribee 5-10-10 . . . . .	1.36	2.10	1.62	5.08	10.08	3.12	7.75	2.00
4	International Caribee 5-10-10 . . . . .	1.50	1.94	1.56	5.00	10.02	3.12	6.67	2.00
1	International Caribee 5-10-10 . . . . .	1.52	1.97	1.59	5.08	10.64	3.49	6.82	2.00

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		MAGNESIUM OXIDE.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.	Found.	Guaranteed.	
International Agricultural Corp.—concluded											
3	International Caribbee 7-5-3 . . . . .	3.10	1.77	1.94	6.81	5.23	.99	2.58	3.20	2.00	
3	International Caribbee 7-5-3 . . . . .	3.02	1.87	2.24	7.13	4.79	1.48	1.45	3.58	2.00	
2	International Caribbee 7-5-3 . . . . .	3.14	1.43	2.27	6.84	5.31	2.94	—	3.68	2.00	
3	International Caribbee 7-12-10 . . . . .	2.52	2.39	2.26	7.17	12.30	3.08	6.51	2.60	—	
Lowell Fertilizer Co.											
3	Lowell 3-10-4 Animal Brand . . . . .	1.10	1.28	.99	3.37	10.10	4.86	—	—	—	
3	Lowell 4-8-4 Corn and Vegetable . . . . .	2.08	1.48	.98	4.54	7.96	4.58	—	—	—	
2	Lowell 4-8-7 Old General Crop Manure for Potatoes and Market Garden Crops . . . . .	2.20	1.40	.91	4.51	8.04	7.27	—	—	—	
4	Lowell 4-8-10 Potato Grower . . . . .	1.98	1.25	1.06	4.29	8.41	10.20	—	—	—	
1	Lowell 4-8-10 Potato Grower . . . . .	2.00	1.00	1.02	4.02	8.09	10.12	—	—	—	
6	Lowell 5-8-7 Market Garden Manure . . . . .	3.14	1.03	1.00	5.17	8.41	7.40	—	—	—	
1	Lowell 5-8-7 Market Garden Manure . . . . .	2.66	1.21	1.17	5.04	8.04	7.31	—	—	—	
3	Lowell 5-8-10 Aroostook Special for Potatoes . . . . .	3.14	1.39	.89	5.42	8.26	10.58	—	—	—	
3	Lowell 7-6-6 Complete Fruit and Top Dressing . . . . .	5.00	1.59	.84	7.43	6.07	6.71	—	—	—	
1	Lowell 7-6-6 Complete Fruit and Top Dressing . . . . .	5.22	1.33	.66	7.21	6.37	6.24	—	—	—	
McClain Brothers Co.											
3	Veg-E-Tonic 21-13-10 . . . . .	11.74	.39	9.95	22.08	14.44	9.44	—	—	—	
Old Deerfield Fertilizer Co., Inc.											
2	Old Deerfield Corn and Seeding Down 3-10-6 . . . . .	.96	.60	1.76	3.32	10.13	6.38	—	—	—	

1	Old Deerfield with Sulphate of Potash 4-8-4	1.12	.95	2.08	4.15	8.08	-	4.87
3	Old Deerfield General Crops 4-8-4	1.10	1.03	2.10	4.23	8.73	4.34	-
4	Old Deerfield Potato 4-8-7	1.78	1.06	1.43	4.32	8.70	6.20	1.32
1	Old Deerfield Potato (Potash other than Muriate) 4-8-7	1.32	1.06	2.04	4.42	8.62	-	7.07
2	Old Deerfield High Potash 4-8-10	1.18	.86	2.05	4.09	8.26	10.41	-
1	Old Deerfield Complete Tobacco 5-3-5	.18	.72	4.25	5.15	3.73	-	5.85
3	Old Deerfield Lawnshrub 5-5-5	1.12	.44	4.65	6.21	7.27	5.62	-
2	Old Deerfield Set Onion 5-8-7	1.86	1.18	1.96	5.00	8.60	5.34	2.26
1	Old Deerfield Set Onion (Potash other than Muriate) 5-8-7	1.24	1.26	2.72	5.22	9.43	-	7.02
3	Old Deerfield Tobacco Starter Bone and Potash 5-8-12	.46	1.79	3.23	5.48	8.65	-	13.60
1	Old Deerfield Tobacco Starter Bone and Potash 5-8-12	.24	1.89	3.26	5.39	8.45	-	13.10
1	Old Deerfield 5-10-5	1.58	1.15	2.51	5.24	10.56	5.87	-
3	Old Deerfield Complete Tobacco 6-3-7	.66	.70	5.00	6.36	3.03	-	8.24
1	Old Deerfield Complete Tobacco 6-3-7	.22	.75	5.27	6.24	4.65	-	8.29
3	Old Deerfield Grass Top Dressing 7-6-6	3.32	3.07	.81	7.20	6.38	1.81	4.55
1	Old Deerfield Grass Top Dressing 7-6-6	3.28	3.01	.89	7.18	6.12	1.96	4.32
1	Old Deerfield with Sulphate of Potash 7-6-6	3.00	2.45	1.54	6.99	6.27	-	6.51
1	Old Deerfield 8-16-14	3.72	1.58	2.51	7.81	16.26	7.22	6.54
1	Old Deerfield with Sulphate of Potash 8-16-14	3.04	.87	4.03	7.94	14.54	-	15.93
2	Valley Brand 4-8-4	1.86	1.72	.84	4.42	8.60	4.38	-
1	Valley Brand 4-8-7	1.92	1.48	.73	4.13	8.10	6.37	-
1	Valley Brand 4-8-10	1.78	1.53	.82	4.13	8.26	10.14	-
1	Valley Brand 5-8-7	2.16	1.70	1.21	5.07	8.35	7.25	-

## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.			Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.		
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.		Total.	As Muriate.	In Forms Other than Muriate.
Old Deerfield Fertilizer Co. — concluded.								
1	Valley Brand 8-16-14	3.18	3.62	.87	14.47	8.84	6.67	
1	Valley Brand 8-16-14	3.28	2.61	1.74	15.38	8.34	6.32	
Olds & Whipple, Inc.								
2	"Luxura" 5-8-6	2.42	.53	2.46	10.08	3.12	3.74	
1	"Luxura" 5-8-6	2.28	.42	2.79	10.06	—	6.74	
2	O & W Blue Label Tobacco Fertilizer 6-3-6	.30	.92	4.81	3.45	—	6.53	
1	O & W Blue Label Tobacco Fertilizer 6-3-6	—	1.08	5.31	3.69	—	6.32	
3	O & W Complete Tobacco Fertilizer 5-3-5	.28	.89	3.94	3.26	—	5.62	
3	O & W High Grade Tobacco Starter and Potash Compound 5-4-15	.38	1.76	2.59	4.21	—	14.65	
3	O & W Market Garden Fertilizer 4-8-4	2.34	1.37	.78	8.21	4.86	—	
3	O & W Market Garden Fertilizer 4-8-4	2.32	1.21	.70	8.22	4.17	—	
1	O & W Market Garden Fertilizer with Sulphate 4-8-4	2.20	1.00	1.05	8.06	—	4.75	
2	O & W Potato and General Purpose Fertilizer 4-8-7	2.70	.70	.85	8.01	7.60	—	
1	O & W Potato and General Purpose Fertilizer 4-8-7	1.84	.87	1.81	8.38	8.10	—	
3	O & W Potato and General Purpose Fertilizer 5-8-7	3.42	.82	1.15	7.99	7.65	—	
1	O & W Potato and General Purpose Fertilizer 5-8-7	3.36	1.20	.68	8.08	7.65	—	
1	O & W 5-8-7 General Purpose Fertilizer with Sulphate	2.62	.70	1.73	9.16	—	7.83	
1	O & W 8-6-6 Top Dressing and Grass Fertilizer	3.34	2.83	1.49	6.12	6.96	—	
1	Wilcox Market Garden Fertilizer 4-8-4	2.28	1.31	.74	8.44	4.34	—	
F. G. Phillips Co.								
2	Ferti-Flora 3-3-3	1.36	1.68	—	3.32	—	3.37	

Plantabbs Corp.									
3	Fulton's Plantabbs 11-15-20 . . . . .	3.80	7.68	.16	11.64	19.22	-	26.58	
Plantspur Products Co.									
1	Plantspur Fertilizer 3-3-2 . . . . .	3.10	.05	.63	3.78	3.45	2.23	-	
Arthur B. Porter									
1	Porter Golf Course Fertilizer 8-6-2 (old stock) . . . . .	3.08	1.64	2.83	7.55	6.58	2.29	-	
Rogers & Hubbard Co.									
2	Alsop Supplement Special Mixture 6-4-14 . . . . .	.30	1.06	5.05	6.41	6.12	-	15.32	
3	"Bone Base" Oats and Top Dressing 8-5-8 . . . . .	.12	7.43	.87	8.42	7.07	2.14	6.52	
6	"Bone Base" Oats and Top Dressing 8-5-8 . . . . .	.12	7.18	.87	8.17	7.78	1.93	6.21	
2	"Bone Base" Seeding Down Fertilizer 3-7-6 . . . . .	1.46	.28	1.98	3.72	6.45	6.61	-	
3	"Bone Base" Soluble Corn and Market Garden Manure 4-8-7 . . . . .	1.34	.82	2.02	4.18	8.29	7.97	-	
2	"Bone Base" Soluble Corn and Market Garden Manure 4-8-7 . . . . .	1.44	.79	1.83	4.06	9.14	7.54	-	
5	"Bone Base" Soluble Potato and Tobacco Manure 5-8-10 . . . . .	2.04	1.27	1.88	5.19	8.83	-	11.45	
2	"Bone Base" Soluble Potato and Tobacco Manure 5-8-10 . . . . .	2.48	.40	2.36	5.24	9.24	-	10.64	
1	Gardenia Special 6-14-4 . . . . .	5.22	.15	.76	6.13	15.46	4.21	-	
1	Gro Fast Plant Food 5-6-6 . . . . .	1.26	.26	3.87	5.39	6.36	-	6.20	
4	Hubbard's All Soils-All Crops, 4-8-4 . . . . .	2.40	.27	1.35	4.02	8.11	4.34	-	
2	Hubbard's All Soils-All Crops, 4-8-4 . . . . .	1.72	.57	1.80	4.09	8.68	4.56	-	
2	Hubbard's Climax Tobacco Brand, 5-3-5 . . . . .	.28	.63	4.44	5.35	3.49	-	5.91	
3	Hubbard's Corn and Grain, 2-12-4 . . . . .	1.30	-	.79 <sup>a</sup>	2.09	12.07	4.65	-	
1	Hubbard's Corn and Grain, 2-12-4 . . . . .	1.20	.05	.94	2.19	12.06	4.55	-	
1	Hubbard's Golf Course Fertilizer, 8-6-2 . . . . .	1.70	.08	6.36	8.14	6.38	2.69	-	
3	Hubbard's High Potash, 2-8-10 . . . . .	1.42	.08	.81	2.31	9.77	8.19	-	
3	Hubbard's High Potash, 2-8-10 . . . . .	1.32	-	.99	2.31	8.32	10.50	-	
5	Hubbard's Potato Fertilizer, 5-8-7 . . . . .	3.24	.67	1.40	5.31	8.42	7.54	-	
5	Hubbard's Potato Fertilizer, 5-8-7 . . . . .	2.80	.63	1.95	5.38	8.27	7.38	-	

<sup>a</sup> The water insoluble nitrogen was of inferior quality.



## Mixtures Substantially Complying with Guarantees — Continued.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Rogers & Hubbard Co. — concluded.								
3	Hubbard's Special 5-8-7 Fertilizer	1.66	1.29	2.12	5.07	9.44	—	7.25
3	Hubbard's Tobacco Grower-Vegetable Formula, Cotton Seed Base, 6-3-6	.52	.55	5.08	6.15	2.99	—	6.59
2	Hubbard's Tobacco Starter 5-4-15	.14	2.34	2.91	5.39	4.39	—	15.04
2	Red H Brand 4-6-10	3.52	.66	.18	4.36	6.38	9.94	—
2	Red H Brand 4-6-10	3.50	.53	.29	4.32	6.71	10.29	—
6	Red H Brand 4-8-4	3.24	.61	.35	4.20	8.73	4.46	—
3	Red H Brand 4-8-4	3.20	.71	.36	4.27	8.24	4.19	—
4	Red H Brand 4-8-7	3.24	.66	.39	4.29	8.49	7.36	—
1	Red H Brand 4-8-7	3.26	.82	.28	4.36	8.17	7.09	—
5	Red H Brand 4-8-10	3.48	.64	.20	4.32	8.47	10.54	—
3	Red H Brand 4-8-10	3.58	.45	.32	4.35	8.80	10.74	—
6	Red H Brand 5-8-7	4.30	.79	.25	5.34	8.39	7.07	—
5	Red H Brand 5-8-7	4.10	.81	.43	5.34	8.57	7.46	—
1	Red H Brand 5-8-7 (Potash from Sulphate of Potash)	4.12	.75	.43	5.30	8.78	—	7.27
5	Red H Brand 7-6-6	6.26	.48	.37	7.11	6.63	6.67	—
2	Red H Brand 7-6-6	6.42	.38	.26	7.06	6.61	6.80	—
3	Red H Brand 8-16-14	7.54	—	.61	8.15	13.65	11.79	4.26
3	Red H Brand 8-16-14	7.62	.19	.64	8.45	15.82	15.00	—
1	Red H 8-16-14 with Sulfate of Potash	7.14	.58	.54	8.26	13.07	—	17.97
1	Rose Food 7-10-5	.62	.22	7.03	7.87	10.56	—	6.94

Rose Manufacturing Co.															
1	Terogen 1-4-4	.	.	.	.	.	.	.	.08	.38	.44	.90	4.17	-	4.86
Salem Chemical & Supply Co.															
2	Plant Food 3-4-3	.	.	.	.	.	.	.	2.36	.25	-	3.61	4.52	4.23	-
O. M. Scott & Sons Co.															
3	Scott's Turf Builder 10-6-4	.	.	.	.	.	.	.	5.70	.57	4.16	10.43	5.39	4.28	-
M. L. Shoemaker & Co., Inc.															
1	Swift-Sure Tobacco Starter 4-10-0	.	.	.	.	.	.	.	2.12	.57	1.51	4.20	9.81	-	-
Standard Wholesale Phosphate & Acid Works, Inc.															
1	Standard 3-8-4	.	.	.	.	.	.	.	2.14	.38	.70	3.22	8.09	4.46	-
1	Standard 3-10-4	.	.	.	.	.	.	.	2.40	.16	.80	3.36	10.02	5.39	-
3	Standard 4-8-4	.	.	.	.	.	.	.	3.10	.26	.82	4.18	7.76	2.55	2.67
4	Standard 4-8-4	.	.	.	.	.	.	.	3.00	.46	.96	4.42	8.36	4.38	-
5	Standard 4-8-4	.	.	.	.	.	.	.	3.14	.06	1.10	4.30	8.03	4.48	-
3	Standard 4-8-7	.	.	.	.	.	.	.	2.84	.31	.93	4.08	8.22	4.56	2.53
2	Standard 4-8-10	.	.	.	.	.	.	.	3.18	.04	.93	4.15	8.24	6.53	3.61
1	Standard 4-8-10	.	.	.	.	.	.	.	3.10	.10	1.09	4.29	8.04	4.61	5.18
2	Standard 4-8-10	.	.	.	.	.	.	.	3.14	-	1.03	4.17	8.42	8.94	-
3	Standard 5-8-7	.	.	.	.	.	.	.	4.00	.56	1.00	5.56	8.04	3.00	4.46
6	Standard 5-8-7	.	.	.	.	.	.	.	4.04	.07	1.06	5.17	8.06	4.16	3.05
4	Standard 5-8-7	.	.	.	.	.	.	.	3.86	.16	1.19	5.21	8.50	7.02	-
2	Standard 5-8-10	.	.	.	.	.	.	.	4.26	.22	.92	5.40	7.98	10.04	-
3	Standard 6-3-7	.	.	.	.	.	.	.	.12	1.37	4.49	5.98	5.15	-	8.56
1	Standard Special Putting Green Fertilizer 6-8-2 (old stock)	.	.	.	.	.	.	.	3.84	.08	1.90	5.82	9.29	2.05	.28
1	Standard 7-6-6	.	.	.	.	.	.	.	5.28	.22	1.33	6.83	6.07	6.42	-
1	Standard 8-6-6	.	.	.	.	.	.	.	6.08	.22	1.15	7.45	7.01	6.18	-

## Mixtures Substantially Complying with Guarantees — Concluded.

Num- ber of Sam- ples.	NAME OF MANUFACTURER AND BRAND.	NITROGEN FOUND.				Available Phosphoric Acid Found.	POTASH (K <sub>2</sub> O) FOUND.	
		In Ammoniacal Forms.	In Nitrate Forms.	In Organic Forms.	Total.		As Muriate.	In Forms Other than Muriate.
Standard Wholesale Phosphate & Acid Works, Inc.-Con.								
1	Standard 8-16-14 . . . . .	6.38	.29	.77	7.44	16.71	14.92	-
Stimuplant Laboratories, Inc.								
2	Stimuplant (Tablets) 11-12-15 . . . . .	2.84	9.20	-	12.04	13.52	-	19.99
Swift & Company Fertilizer Works								
2	Swift's Special Golf Fertilizer 12-6-4 . . . . .	11.26	.44	.34	12.04	6.38	4.81	-
4	Vigoro 4-12-4 . . . . .	3.52	.39	.32	4.23	12.50	4.85	-
F. Sylvester & Son								
2	Dove Brand Fertilizer 4-6-3 . . . . .	2.50	.10	2.57	5.17	6.45	3.80	-
Synthetic Nitrogen Products Corp.								
3	Nitrophoska 15-30-15 . . . . .	12.28	2.57	.53	15.38	30.18	15.12	-
Tennessee Corp.								
3	Soil-Prep (4-2-2) . . . . .	2.32	.22	1.69a	4.23	2.86	2.22	.61
3	Loma (5-10-4) . . . . .	4.20	.65	.57	5.42	11.04	4.21	-
1	Loma (5-10-4) . . . . .	4.16	.41	.60	5.17	10.64	4.03	-
Wm. Thomson & Sons, Ltd.								
1	Thomson's Vine Plant and Vegetable Manure 3-7-4 (old stock)	2.02	-	1.97	3.99	10.31	-	6.45

Victory Products Co.										
2	Victory Lawn and Garden Fertilizer 4-8-4 . . . . .	2.12	1.08	1.43	4.63	8.04	4.15	-		
6	Victory Putting Green Fertilizer (Brand B) 6-8-2 . . . . .	4.02	1.44	1.41	6.87	8.24	2.34	-		
Virginia-Carolina Chemical Corp.										
1	BloomAid (New Process) 4-10-3 . . . . .	2.80	.40	1.54	4.74	11.61	1.12	2.46		
1	BloomAid 10-14-6 (old stock carried over from 1932) . . . . .	9.62	.13	.36	10.11	14.78	-	6.80		
3	V-C Fairway Fertilizer (New Process) 6-6-4 . . . . .	4.12	.51	1.19 <sup>a</sup>	5.82	6.69	-	4.69		
4	V-C Fairway Fertilizer (New Process) 6-6-4 . . . . .	3.88	.45	1.37	5.70	6.25	2.27	2.00		
1	V-C Fertilizer 2-10-2 . . . . .	1.50	.20	.65	2.35	12.27	4.80	-		
1	V-C Fertilizer 4-8-4 . . . . .	2.74	.38	1.24	4.36	8.70	4.71	-		
1	V-C Fertilizer 4-8-10 . . . . .	2.88	.35	.85	4.08	8.17	10.41	-		
1	V-C Fertilizer 5-8-7 . . . . .	3.62	.34	1.09	5.05	8.54	7.13	-		
Vita-Vim Co.										
1	Vita-Vim 6-10-4 . . . . .	3.28	.53	2.83	6.64	10.46	-	5.99		
C. P. Washburn Co.										
3	"Made Right" Market Garden 5-8-7 . . . . .	3.70	.68	.67	5.05	8.34	7.05	-		
3	"Made Right" Special Potato 4-8-10 . . . . .	2.84	.40	1.01	4.25	8.01	9.51	-		
2	"Made Right" Corn and Vegetable 4-8-4 . . . . .	2.98	.33	.92	4.23	8.16	4.15	-		
E. E. Williams										
1	Hydromed Formula A 14-24-12 . . . . .	10.38	1.38	.26	12.02	25.64	18.82	-		
Winslow Nurseries										
1	Green Valley Plant Food 5-10-7 . . . . .	72	1.30	3.71	5.73	8.91	6.41	-		

<sup>a</sup> The water insoluble nitrogen was of inferior quality.

## CHEMICALS AND RAW PRODUCTS.

## Summary of Results of the Inspection of Fertilizer Simples and Raw Products.

MATERIAL.	Number of Samples Collected.	Number of Analyses Made.	Average Percentage of Nitrogen.	Average Percentage of Total Phosphoric Acid.	Average Percentage of Available Phosphoric Acid.	Average Percentage of Water Soluble Potash.	Average Selling Price Per Ton.	Average Commercial Valuation per Ton.	Cost of One Pound of Plant Food (Cents).
Nitrate of soda . . .	42	9	16.08a	-	-	-	\$32.32	\$31.36	10.05 (nitrogen)
Nitrate of potash . .	6	5	13.31b	-	-	44.39	58.54	57.02	10.0 (nitrogen)
Nitrate of soda-potash	12	5	14.48c	-	-	15.41	43.18	39.03	3.6 (potash)
Nitrate of lime . . .	2	1	15.42	-	-	-	37.57	30.07	10.8 (nitrogen)
Cal-Nitro . . . . .	12	6	20.54	-	-	-	34.87	35.44	3.9 (potash)
Ammonium sulfate . .	54	23	20.76	-	-	-	34.41	31.14	8.5 (nitrogen)
Synthetic urea . . .	2	2	46.24	-	-	-	105.20	106.35	8.3 (nitrogen)
Cyanamid . . . . .	8	3	21.23	-	-	-	34.95	36.09	11.38 (nitrogen)
Ammo-Phos A . . .	8	3	10.97	49.84	48.46	-	62.38	65.33	8.2 (nitrogen)
									7.2 (nitrogen)
									4.8 (available phosphoric acid)
Ammo-Phos B . . .	1	1	16.16	22.36	21.31	-	-	45.87	-
Cottonseed meal . .	58	58	6.62	2.70	-	1.88d	29.43	29.79e	22.2 (nitrogen)
Castor pomace . . .	10	10	5.80	1.84	-	1.21d	32.18	26.10e	27.7 (nitrogen)
Linseed meal . . .	2	2	6.07	1.95	-	1.47d	37.12	27.32e	30.6 (nitrogen)
Dried blood . . . .	11	5	11.57	2.03	-	-	61.55	51.37	25.75 (nitrogen)
Milorganite . . . .	7	1	5.93	3.09	-	-	36.18	25.60	27.74 (nitrogen)
Superphosphate 16%	83	20	-	17.20	16.96	-	16.13	17.03	4.74 (available phosphoric acid)
Superphosphate 20%	14	4	-	20.87	20.24	-	20.26	20.43	4.96 (available phosphoric acid)
Superphosphate 40%	4	1	-	40.70	40.27	-	36.61	40.40	4.53 (available phosphoric acid)
Basic slag phosphate .	7	2	-	18.06	15.37	-	19.36	16.18	5.98 (available phosphoric acid)
Precipitated bone . .	4	3	-	40.62	39.10	-	36.24	39.56	4.58 (available phosphoric acid)
									2.94 (potash)
Muriate of potash . .	56	18	-	-	-	59.94	35.30	32.97	-
High grade sulfate of potash	13	10	-	-	-	51.34	45.99	42.61	4.48 (potash)
Potash-magnesia sulfate	3	3	-	-	-	27.87f	32.40	23.13	5.81 (potash)
Cotton hull ashes . .	6	6	-	3.37	-	30.76g	50.09	42.73	7.27 (potash)
Wood ashes . . . . .	2	2	-	1.89	-	8.05h	50.00	16.28	-
Dry ground fish . . .	26	14	9.76	6.78i	-	-	46.85	44.46	21.08 (nitrogen)
Animal tankage . . .	33	19	9.65	8.42j	-	-	49.77	44.17	19.6 (nitrogen)
									3.75 (phosphoric acid)
Ground bone . . . . .	96	30	2.65	25.26k	-	-	39.79	30.75	27.45 (nitrogen)
									5.0 (phosphoric acid)
Ground tobacco stems	1	1	2.81	.45	-	3.51l	30.00	15.42	-
Pulverized sheep manure	33	13	1.51	1.04m	-	2.92d	41.51	7.60	-
Pulverized sheep and goat manure	24	7	1.62	1.23m	-	3.27d	37.75	8.33	-
Pulverized cattle manure	20	10	2.12	1.56m	-	2.35d	47.93	9.52	-
Pulverized poultry manure	7	2	4.91	2.37m	-	1.23d	50.00	15.93	-
Pulverized poultry manure and peat	3	1	3.54	3.04m	-	1.68d	36.67	12.85	-
Sheep manure and wool waste	1	1	1.99	.57m	-	5.35d	10.00	10.52	-

a Average percentage of chlorine, .20%.

b Average percentage of chlorine, .23%.

c Average percentage of chlorine, .46%.

d Total potash.

e Not counting the value of the phosphoric acid or potash.

f Magnesium oxide, 12.92%; chlorine, 1.37%.

g Calcium oxide, 12.25%; magnesium oxide, 5.58%; moisture, 5.78%; insoluble matter, 15.56%.

h Calcium oxide, 35.72%; magnesium oxide, 4.09%; moisture, 9.09%; insoluble matter, 8.56%.

i Chlorine, .09%.

j Average tankage finer than 1/50 inch, 49.83%; coarser than 1/50 inch, 50.17%.

k Average bone finer than 1/50 inch, 72.20%; coarser than 1/50 inch, 27.80%.

l Organic matter, 66.08%.

m Average organic matter: sheep manure, 42.53%; sheep and goat manure, 39.80%; cattle manure, 69.78%; poultry manure, 62.09%; poultry manure and peat, 69.46%; sheep manure and wool waste, 44.55%.

Note: The average pound cost of nitrogen, phosphoric acid and potash from all of the pulverized natural manures taken collectively would be as follows: nitrogen, 73 cents; phosphoric acid, 16 cents, and potash, 16 cents.

## Nitrogen Compounds.

The chemicals and unmixed materials under this heading are valued chiefly for the nitrogen which they contain. Some of them, however, contain more than this one element; the nitrate of potash containing potash; the calcium nitrate and cyanamid containing lime; and the organic vegetable substances containing small quantities of phosphoric acid and potash, as will be noticed by a reference to the summary table on the previous page.

Brands showing a commercial shortage of one dollar or more per ton are listed by themselves, serious deficiencies being emphasized by boldface type.

## Sulfate of Ammonia and Nitrate of Soda.

MANUFACTURER.	SULFATE OF AMMONIA.			NITRATE OF SODA.			CHLORINE.  Found.
	Number of Samples.	NITROGEN.		Number of Samples.	NITROGEN.		
		Found.	Guaran- teed.		Found.	Guaran- teed.	
American Agricultural Chemical Co.	1	20.78	20.50	-	-	-	-
Apothecaries Hall Co.	4	20.84	20.50	-	-	-	-
Armour Fertilizer Works	3	20.66	20.56	-	-	-	-
Barrett Co.	2	20.76	20.50	-	-	-	-
	3	20.86	20.56	1	16.18	16.00	-
	5	20.68	20.56	7	16.10	16.00	.16
	1	20.82	20.56	6	16.24	16.00	-
	3	20.80	20.56	5	16.08	16.00	-
	2	20.82	20.56	6	16.20	16.00	-
Chilean Nitrate Sales Corp.	-	-	-	9a	16.02	16.00	.42
	-	-	-	4b	15.86	15.25	.52
Consolidated Rendering Co.	5	20.84	20.50	-	-	-	-
	5	20.66	20.50	-	-	-	-
Eastern States Farmers' Exchange	5	20.96	20.50	-	-	-	-
Ford Motor Co.	2	20.80	20.80	-	-	-	-
Goulard & Olen, Inc.	1	20.80	20.75	-	-	-	-
Hudson Valley Fuel Corp.	1	20.66	20.80	-	-	-	-
International Agricultural Corp.	3	20.72	20.56	-	-	-	-
	1	20.56	20.56	-	-	-	-
	1	20.64	20.56	-	-	-	-
Merrimac Chemical Co.	-	-	-	2	16.30	16.25	.20
Old Deerfield Fertilizer Co., Inc.	1	20.62	20.50	2	15.86	15.50	.54
Rogers & Hubbard Co.	3	20.54	20.50	-	-	-	-
Standard Wholesale Phosphate & Acid Works, Inc.	1	20.90	20.56	-	-	-	-

## Brand Showing Commercial Shortage of More than \$1 per Ton.

International Agricultural Corp.	19.82	20.56c	-	-	-	-
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a Champion brand.

b Standard brand.

c Commercial shortage, \$1.11 per ton. Explanation of manufacturer: This product was re-milled and in putting it through the grinder it was contaminated by other plant foods in the mill. We ran a test by the modified Kjeldahl method and found 20.18% total nitrogen; there was also present .53% phosphoric acid and .43% water soluble potash. This confirms the findings of the manufacturer.

## Nitrate of Potash, Nitrate of Soda-Potash.

MANUFACTURER.	Number of Samples.	NITROGEN.		POTASSIUM OXIDE.		Chlorine.
		Found.	Guaranteed.	Found.	Guaranteed.	
Berkshire Chemical Co. . . . .	1	13.32	13.00	45.00	44.00	.28
Chilean Nitrate Sales Corp. . . . .	1a	14.26	14.00	15.07	13.00	.52
	4a	14.86	14.00	15.90	14.00	.40
	1a	14.86	14.80	15.97	14.00	.44
	2a	14.92	14.00	15.97	14.00	.42
Eastern States Farmers' Exchange . . . . .	1	13.34	13.00	44.38	44.00	.22
International Agricultural Corp. . . . .	4a	14.80	14.00	15.90	14.00	.34
	1	13.04	13.00	43.54	44.00	.32
Old Deerfield Fertilizer Co., Inc. . . . .	1	13.22	13.00	44.12	44.00	.05
	2	13.02	13.00	44.04	44.00	.24
Rogers & Hubbard Co. . . . .	1	13.10	13.00	44.20	44.00	.20

a Nitrate of soda-potash.

## Calcium Nitrate, Cal-Nitro, Calcium Cyanamid and Urea.

MANUFACTURER.	BRAND.	Number of Samples.	NITROGEN.	
			Found.	Guaranteed.
American Cyanamid Co. . . . .	"Aero" Cyanamid, Granular	5	21.20	21.00
	"Aero" Cyanamid, Granular	1	21.56	21.00
	"Aero" Cyanamid (1935 stock)	2	21.66	22.00
Armour Fertilizer Works . . . . .	Cal-Nitro . . . . .	1	20.66	20.50
Eastern States Farmers' Exchange . . . . .	Eastern States Urea . . . . .	1	46.24	46.00
	Eastern States Cal-Nitro . . . . .	6	20.72	20.50
	Eastern States Cal-Nitro . . . . .	1	20.78	20.50
	Eastern States Cal-Nitro . . . . .	2	20.50	20.50
Foodndrink Fertilizer Co. . . . .	Foodndrink (a) . . . . .	1	16.40	13.00
Synthetic Nitrogen Products Corp. . . . .	Calcium Nitrate . . . . .	2	15.42	15.00
	Urea . . . . .	1	46.12	46.00
	Cal-Nitro . . . . .	1	16.46	16.00

## Brands Showing Commercial Shortage of More than \$1 per Ton.

Apothecaries Hall Co. . . . .	Cal-Nitro (b) . . . . .	1	19.41	20.50
E. E. Williams, Agent for American Hydrolizer Co. . . . .	Hydrocide Formula L (c) . . . . .	1	32.88	46.00

a Nitrogen practically all as nitrate.

b This product, imported by the Synthetic Nitrogen Products Corp., 285 Madison Ave., New York City, is usually shipped in tight paper-lined bags, but due to an error in shipping this particular lot it was put into unlined bags, and due also to the unusually wet conditions which prevailed during the early spring, the product absorbed an excessively large amount of water which correspondingly lowered the percentage of nitrogen contained in a given weight of the material. A satisfactory settlement was made by the Synthetic Nitrogen Products Corp. for the nitrogen deficiency on that portion of the lot that was sold at retail. The balance of the product was returned to the distributor, Apothecaries Hall Co., Waterbury, Conn. The product showed a commercial shortage of \$1.88 per ton.

c The product was Synthetic Urea, to which some coloring matter had been added to facilitate its use in the hydrolizer with hose attachment. Less than 100 pounds was sold in the state. The nitrogen guarantee will be reduced before another season. The commercial shortage was \$30.18 per ton.

## Cottonseed Meal.

MANUFACTURER.	BRAND.	NITROGEN.	
		Found.	Guaranteed.
Ashcraft-Wilkinson Co. . . . .	Cow-Eta Brand . . . . .	6.91	6.56
	Cow-Eta Brand . . . . .	6.65	6.56
	Cow-Eta Brand . . . . .	6.98	6.58
Cairo Meal and Cake Co. . . . .	Cow-Eta Brand . . . . .	6.31	5.76
	Miss Cairo Brand . . . . .	5.81	5.76
	Miss Cairo Brand . . . . .	6.70	5.76
Humphreys-Godwin Co. . . . .	Bull Brand . . . . .	6.81	6.87
	Dixie Brand . . . . .	6.63	6.56
	Dixie Brand . . . . .	6.81	6.56
	Dixie Brand . . . . .	6.58	6.56
	Dixie Brand . . . . .	7.11	6.56
	Dixie Brand . . . . .	6.70	6.56
	Dixie Brand . . . . .	6.57	6.56
	Dixie Brand . . . . .	6.64	6.56
	Dixie Brand . . . . .	6.91	6.56
	Dixie Brand . . . . .	6.70	6.56
	Dixie Brand . . . . .	6.78	6.58
	Dixie Brand . . . . .	6.81	6.56
	Dixie Brand . . . . .	6.45	6.56
	Dixie Brand . . . . .	6.74	6.56
	Dixie Brand . . . . .	6.65	6.56
	Dixie Brand . . . . .	6.77	6.56
	Dixie Brand . . . . .	6.63	6.56
	Dixie Brand . . . . .	6.71	6.56
	Dixie Brand . . . . .	6.71	6.56
	Dixie Brand . . . . .	6.78	6.56
	Dixie Brand . . . . .	6.51	6.56
	Dixie Brand . . . . .	6.65	6.56
	Dixie Brand . . . . .	6.67	6.56
	Dixie Brand . . . . .	6.83	6.56
	Dixie Brand . . . . .	6.94	6.56
	Dixie Brand . . . . .	6.85	6.56
	Dixie Brand . . . . .	6.62	6.56
	Dixie Brand . . . . .	6.81	6.56
	Dixie Brand . . . . .	6.63	6.56
	Dixie Brand . . . . .	6.73	6.56
	Dixie Brand . . . . .	6.68	6.56
	Dixie Brand . . . . .	6.69	6.56
	Dixie Brand . . . . .	6.65	6.56
	Brown . . . . .	6.68	6.56
	Brown . . . . .	6.49	6.56
	Brown . . . . .	6.61	6.56
International Vegetable Oil Co. . . . .	High Grade . . . . .	7.22	6.58
	High Grade . . . . .	6.59	6.58
	High Grade . . . . .	6.67	6.58
L. B. Lovitt & Co. . . . .	Lovitt Brand . . . . .	6.65	6.56
	Lovitt Brand . . . . .	6.67	6.56
	Lovitt Brand . . . . .	6.59	6.56
	Lovitt Brand . . . . .	6.63	6.56
	Lovitt Brand . . . . .	6.66	6.56
	Lovitt Brand . . . . .	6.57	6.56
	Lovitt Brand . . . . .	6.64	6.56
	Lovitt Brand . . . . .	6.64	6.56

## Brands Showing a Commercial Shortage of More than \$1 per Ton.

Ashcraft-Wilkinson Co. . . . .	Cow-Eta Brand . . . . .	6.18a	6.56
Cairo Meal and Cake Co. . . . .	Miss Cairo Brand . . . . .	5.24b	5.76
International Vegetable Oil Co. . . . .	High Grade . . . . .	6.36c	6.58

a Commercial shortage per ton, \$1.59.

b Commercial shortage per ton, \$2.17.

c Commercial shortage per ton, \$1.14.



## Castor Pomace and Linseed Meal.

MANUFACTURER.	BRAND.	NITROGEN.	
		Found.	Guaranteed.
American Agricultural Chemical Co. . . . .	Castor Pomace . . . . .	4.96	4.53
Armour Fertilizer Works . . . . .	{ Castor Pomace . . . . .	5.12	4.52
	{ Castor Pomace . . . . .	5.98	4.52
Baker Castor Oil Co. . . . .	Castor Pomace . . . . .	6.55	4.50
Berkshire Chemical Co. . . . .	Castor Pomace . . . . .	4.99	4.50
International Agricultural Corp. . . . .	{ Castor Pomace . . . . .	4.92	4.53
	{ Castor Pomace . . . . .	5.72	4.53
	{ Castor Pomace . . . . .	4.55	4.53
Kelloggs & Miller, Inc. . . . .	K & M Linseed Oil Meal . . . . .	5.78	5.44
Spencer Kellogg & Sons, Inc. . . . .	{ Castor Pomace . . . . .	5.85	4.52
	{ Kellogg's Old Process Linseed Meal . . . . .	6.50	5.92
Old Deerfield Fertilizer Co., Inc. . . . .	Old Deerfield Castor Pomace . . . . .	5.85	4.52

## Dried Blood and Milorganite.

MANUFACTURER AND BRAND.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.	
		Found.	Guaranteed.	Found.	Guaranteed.
Consolidated Rendering Co. Dried Blood . . . . .	2	13.42	13.00	.32	—
New England Rendering Co. Brighton Dried Blood . . . . .	5	11.79	11.51	2.19	—
John Reardon & Sons Co. Rearco Dried Blood . . . . .	2	11.10	10.00	2.04	—
Rogers & Hubbard Co. Dried Blood . . . . .	1	13.66	12.00	.47	—
Sewerage Commission of Milwaukee Milorganite . . . . .	7	5.93	6.00	3.09	2.75

## Brand Showing Commercial Shortage of More than \$1 per Ton.

John Reardon & Sons Co. Dried Blood . . . . .	1	8.26a	10.00	3.44	—
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a Commercial shortage, \$4.90 per ton.

## Phosphoric Acid Compounds.

## Superphosphate, Precipitated Bone and Basic Slag Phosphate.

MANUFACTURER AND BRAND.	Number of Samples.	Total Phosphoric Acid.	AVAILABLE PHOSPHORIC ACID.	
			Found.	Guaranteed.
Acme Guano Co.				
Acme 16% Superphosphate . . . . .	2	16.34	15.52	16.00
American Agricultural Chemical Co.				
AA 16% Superphosphate . . . . .	6	17.77	17.25	16.00
AA 16% Superphosphate . . . . .	7	17.48	16.79	16.00
AA 16% Superphosphate . . . . .	1	17.13	16.49	16.00
AA 20% Superphosphate . . . . .	1	20.49	19.80	20.00
Co-op 16% Superphosphate . . . . .	7	17.53	16.71	16.00
Co-op 16% Superphosphate . . . . .	1	17.02	16.18	16.00
Basic Slag . . . . .	1	18.11	14.95	- a
Apothecaries Hall Co.				
Superphosphate 16% . . . . .	2	17.45	16.79	16.00
Armour Fertilizer Works				
Armours Big Crop Superphosphate 16% . . . . .	7	16.71	16.28	16.00
Armours Big Crop Superphosphate 20% . . . . .	1	20.97	20.00	20.00
Baugh & Sons Co.				
Baughphos The Ideal 16% Superphosphate . . . . .	1	18.22	16.77	16.00
Berkshire Chemical Co.				
Berkshire 16% Superphosphate . . . . .	2	16.97	16.41	16.00
Berkshire 20% Superphosphate . . . . .	1	20.66	20.15	20.00
Berkshire Precipitated Bone Phosphate . . . . .	1	39.62	39.11	38.00
Consolidated Rendering Co.				
Superphosphate 16% . . . . .	8	17.14	16.88	16.00
Superphosphate 16% . . . . .	5	16.90	16.90	16.00
Eastern States Farmers' Exchange				
Eastern States 20% Superphosphate (Granular) . . . . .	11	20.92	20.31	20.00
Eastern States 40% Double Superphosphate . . . . .	4	40.70	40.27	40.00
Eastern States Precipitated Bone . . . . .	2	40.82	39.03	38.00
International Agricultural Corp.				
International 16% Superphosphate . . . . .	6	17.07	16.61	16.00
International 16% Superphosphate . . . . .	8	17.17	16.66	16.00
International Basic Slag . . . . .	6	18.06	15.38	14.40
Old Deerfield Fertilizer Co., Inc.				
Old Deerfield 16% Superphosphate . . . . .	1	20.13	19.85	16.00
Old Deerfield Precipitated Bone . . . . .	1	40.28	39.82	38.00
Rogers & Hubbard Co.				
Hubbard's Superphosphate . . . . .	9	17.12	16.41	15.00
Standard Wholesale Phosphate & Acid Works, Inc.				
Standard 16% Superphosphate . . . . .	5	17.02	16.05	16.00
16% Superphosphate Pinkerton Bell . . . . .	3	16.75	16.12	16.00
Virginia-Carolina Chemical Corp.				
V-C 16% Superphosphate . . . . .	1	17.55	16.20	16.00
C. P. Washburn Co.				
Superphosphate 16% . . . . .	1	17.17	16.35	16.00

a Only the total phosphoric acid was guaranteed.

## Potash Compounds.

## Sulfate of Potash-Magnesia.

MANUFACTURER.	Number of Samples.	POTASH.		MAGNESIUM OXIDE.	Chlorine.
		Found.	Guaranteed.	Acid Soluble Found.	
Eastern States Farmers' Exchange . . . . .	1	26.01	26.00	9.46	2.00
Old Deerfield Fertilizer Co., Inc. . . . .	1	31.54	25.00	12.33	.99
	1	28.44	26.00	14.08	1.16

## Muriate and High Grade Sulfate of Potash.

MANUFACTURER.	MURIATE OF POTASH.			HIGH GRADE SULFATE OF POTASH.			
	Number of Samples.	POTASH.		Number of Samples.	POTASH.		Chlorine.
		Found.	Guaranteed.		Found.	Guaranteed.	
American Agricultural Chemical Co. . . . .	{ 3	49.76	50.00	2	49.32	48.00	1.24
	{ 5	61.36	60.00	1	49.84	48.00	.96
	{ 1	62.50	60.00	2	49.96	48.00	1.21
	{ 2	61.48	60.00	—	—	—	—
Apothecaries Hall Co. . . . .	{ 1	48.40	50.00	—	—	—	—
	{ 6	61.55	60.00	—	—	—	—
Armour Fertilizer Works . . . .	3	53.44	50.00	—	—	—	—
Berkshire Chemical Co. . . . .	2	51.16	50.00	1	50.60	48.00	2.40
Consolidated Rendering Co. . . .	{ 4	50.84	50.00	1	50.82	48.00	1.71
	{ 6	61.06	60.00	—	—	—	—
Eastern States Farmers' Exchange	7	60.86	60.00	2	49.68	48.00	1.28
International Agricultural Corp.	{ 3	52.92	50.00	1	50.46	48.00	1.20
	{ 5	62.96	60.00	1	48.48	48.00	2.22
	{ 2	62.12	60.00	1	48.24	48.00	2.36
Old Deerfield Fertilizer Co., Inc.	{ 1	53.56	50.00	1	53.00	48.00	2.34
	{ 3	62.36	60.00	—	—	—	—
Rogers & Hubbard Co. . . . .	3	52.00	50.00	—	—	—	—
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	1	49.46	50.00	—	—	—	—

## Products Supplying Nitrogen and Phosphoric Acid.

## Dry Ground Fish.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		Chlorine.
		Found.	Guaran- teed.	Found.	Guaran- teed.	
American Agricultural Chemical Co.	{ 2	9.60	9.46	6.51	5.00	.06
	1	9.08	9.00	8.24	4.00	.09
Apothecaries Hall Co. . . . .	2	10.36	9.46	6.43	5.00	.09
Armour Fertilizer Works . . . .	2	9.68	9.46	6.58	5.00	.10
Berkshire Chemical Co. . . . .	8	9.49	9.46	6.76	5.00	.08
Consolidated Rendering Co. . . .	1	10.20	9.00	9.31	5.00	.46
Eastern States Farmers' Exchange	1	9.72	9.00	5.61	5.00	.09
International Agricultural Corp. .	1	9.03	9.00	7.70	4.00	.09
Old Deerfield Fertilizer Co., Inc. .	{ 2	9.94	9.05	7.53	5.00	.10
	1	9.87	9.05	7.40	5.00	.09
Olds & Whipple, Inc. . . . .	1	9.62	9.00	6.20	5.00	.09
Rogers & Hubbard Co. . . . .	{ 2	10.41	9.46	6.56	5.00	.09
	1	9.69	9.46	7.27	5.00	.08
Standard Wholesale Phosphate & Acid Works, Inc. . . . .	1	9.09	8.80	8.55	5.00	.10

## Ammono-Phos.

MANUFACTURER.	Number of Samples.	NITROGEN.		PHOSPHORIC ACID.		
		Found.	Guaran- teed.	Total.	AVAILABLE.	
					Found.	Guaran- teed.
American Cyanamid Co.	1	11.12	11.00	50.30	49.18	48.00
	6	10.96	11.00	49.80	48.40	48.00
	1	11.28	11.00	51.10	50.33	48.00
	1	16.16	16.00	22.36	21.31	20.00

## Animal Tankage.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOS- PHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaran- teed.	Found.	Guaran- teed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
American Agricultural Chemi- cal Co.	1	7.06	7.40	10.64	9.15	50.38	49.62
	1	7.67	7.40	10.46	9.15	46.80	53.20
	1	9.89	10.00	7.27	7.41	50.78	49.22
	1	9.86	10.00	7.55	7.41	50.78	49.22
	1	9.88	10.00	7.40	7.41	50.78	49.22
	2	9.91	10.00	7.48	7.41	53.40	46.60
Armour Fertilizer Works Consolidated Rendering Co.	2	7.44	7.40	10.33	9.15	57.07	42.93
	5	7.55	7.41	11.05	9.15	52.89	47.11
	1	8.72	8.50	10.03	9.75	41.83	58.17
	6	10.13	10.00	9.25	6.87	52.83	47.17
International Agricultural Corp.	4	10.01	10.00	8.61	6.87	42.25	57.75
Rogers & Hubbard Co.	1	10.00	10.00	8.62	7.00	49.10	50.90
N. Roy & Son	1	8.41	7.00	9.62	8.00	52.57	47.43
Woodard Brothers	1	5.08	4.50	20.72	18.00	51.69	48.31

## Brands Showing Commercial Shortage of More than \$1 per Ton.

American Agricultural Chemi- cal Co.	1a	9.73	10.00	7.05	7.41	55.10	44.90
	1b	9.41	10.00	7.14	7.41	50.78	49.22
	1c	9.46	10.00	7.91	7.41	50.78	49.22
	1d	9.57	10.00	7.86	7.41	50.78	49.22
Old Deerfield Fertilizer Co., Inc.	1e	10.20	10.00	1.14	5.00	54.86	45.14

The commercial shortages were as follows: a \$1.48; b \$2.52; c \$1.75; d \$1.36; e \$2.11.

## Ground Bone.

MANUFACTURER.	Number of Samples.	NITROGEN.		TOTAL PHOSPHORIC ACID.		DEGREE OF FINENESS.	
		Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1/50 Inch.	Coarser than 1/50 Inch.
American Agricultural Chemical Co.	9	2.50	2.47	24.62	23.00	76.25	23.75
Apothecaries Hall Co.	1	3.98	2.47	23.45	23.00	55.64	44.36
	2	4.10	3.70	22.83	21.00	56.81	43.19
Armour Fertilizer Works	7	2.46	2.47	24.67	23.00	67.29	32.71
	1	2.40	2.47	24.54	22.00	68.37	31.63
Baugh & Sons Co.	2	2.58	2.47	25.13	23.00	67.69	32.31
Berkshire Chemical Co.	4	2.12	2.05	29.31	25.00	81.46	18.54
Joseph Breck & Sons Corp.	2	2.76	2.47	24.41	22.88	76.22	23.78
Consolidated Rendering Co.	8	2.59	2.47	24.34	23.00	76.46	23.54
	2	4.03	4.00	21.94	20.00	41.74	58.26
Eastern States Farmers' Exchange	4	2.74	2.50	24.98	23.00	73.41	26.59
Goulard & Olen, Inc.	1	4.15	2.40	24.75	22.75	65.84	34.16
Dr. Heinz Co.	1	1.02	1.00	32.07	29.00	87.08	12.92
A. H. Hoffman, Inc.	1	3.70	3.70	22.88	20.00	72.37	27.63
International Agricultural Corp.	5	2.62	2.47	24.49	22.00	73.51	26.49
	1	2.55	2.47	24.77	23.00	71.26	28.74
Master Meat Products Co.	3	4.09	4.00	24.95	25.00	39.42	60.58
New England Chemical Industries, Inc.	1	1.30	.82	33.37	32.00	68.81	31.19
Old Deerfield Fertilizer Co., Inc.	3	2.57	2.47	28.28	22.00	78.80	21.20
Olds & Whipple, Inc.	1	2.48	2.47	28.10	22.00	73.52	26.48
John Reardon & Sons Co.	7	2.76	2.47	23.98	22.88	65.75	34.25
Rogers & Hubbard Co.	8	2.75	2.47	25.59	22.85	68.49	31.51
	3	3.79	3.70	26.02	24.70	93.64	6.36
	5	4.10	3.70	23.34	20.00	56.86	43.14
	1*	4.30	3.70	23.88	21.50	49.64	50.36
N. Roy & Son	1	2.50	2.50	27.78	24.00	66.82	33.18
F. Rynveld & Sons, Inc.	3	2.92	2.47	24.70	22.00	70.05	29.95
Standard Wholesale Phosphate & Acid Works, Inc.	1	2.52	2.47	23.73	23.00	57.73	42.27
Swift & Co.	7	2.97	2.47	25.21	23.00	75.46	24.54
Van Horne Chemical Co., Inc.	1	2.40	2.40	29.82	22.75	66.35	33.65

\* 1935 stock.

## Miscellaneous Fertilizer Materials.

## Commercial Peat Products.

MANUFACTURER AND BRAND.	Number of Samples.	Water.	Organic Matter.	Mineral Matter.	NITROGEN.	
					Found.	Guaranteed.
Brague, Inc.						
Hinsdale Leafmold	1	46.05	46.35	7.60	.90	.50
Florida Humus Co.						
Florida Humus	4	25.40	67.70	6.90	2.56	2.18

Note: The following new ruling became effective for 1936 with reference to commercial peat products sold in Massachusetts:

Peat products may be sold in Massachusetts without registration provided no claim is made either verbally or printed on the container, in circulars, advertisements or other literature, for the content of nitrogen or other plant food elements present.

## Cotton Hull Ashes and Wood Ashes.

MANUFACTURER AND BRAND.	Moisture.	PHOSPHORIC ACID.		POTASSIUM OXIDE.		Calcium Oxide.	Magnesium Oxide.	Insoluble Matter.
		Found.	Guaran- teed.	Found.	Guaran- teed.			
<b>Berkshire Chemical Co.</b>								
Cotton Hull Ashes . . . .	4.30	3.42	-	28.46	25.00	11.62	4.64	24.68
Cotton Hull Ashes . . . .	5.15	3.32	-	30.70	30.00	13.10	4.88	15.13
Cotton Hull Ashes . . . .	4.75	3.64	-	31.18	25.00	12.69	6.26	16.85
<b>John Joynt</b>								
Canada Hardwood Ashes . .	9.15	1.89	2.00	8.02	5.00	35.67	4.09	8.58
Canada Hardwood Ashes . .	8.25	1.94	2.00	8.49	5.00	36.38	4.11	8.31
<b>Old Deerfield Fertilizer Co., Inc.</b>								
Old Deerfield Cotton Hull Ashes . . . . .	6.70	3.27	-	30.80	25.00	12.27	5.58	12.85
Old Deerfield Cotton Hull Ashes . . . . .	3.90	3.16	-	31.72	25.00	11.37	5.00	21.27
<b>Olds &amp; Whipple, Inc.</b>								
O & W Cotton Hull Ashes .	2.70	4.40	-	38.84	20.00	13.76	6.03	8.48

## Ground Tobacco Stems.

MANUFACTURER.	Moisture.	NITROGEN.		PHOSPHORIC ACID.		POTASSIUM OXIDE.		Organic Matter.
		Found.	Guaran- teed.	Found.	Guaran- teed.	Found.	Guaran- teed.	
Interstate Chemical Manufac- turing Co. . . . .	13.60	2.81	1.75	.45	.25	3.51	3.50	66.08

## Fish Organo 4-3-1 \*

MANUFACTURER.	Moisture.	FORMS OF NITROGEN FOUND.				Available Phos- phoric Acid.	Water Solu- ble Potash.	Organic Matter.
		Total.	Ammo- niacal	Nitrate.	Organic.			
Soil Regenerator Corp. for Dehydrating Process Co. .	16.35	4.84	.76	.35	3.73	4.16	1.67	62.97
	19.61	4.85	.92	.48	3.45	3.69	1.80	62.60

\* This product is said to be a decomposed mixture of fish and cocoa shells. The water insoluble organic nitrogen shows an activity of 80.20% by the neutral permanganate method. The passing mark is 80. There are only traces of chlorine present and the fertilizer is slightly alkaline in reaction. For most cultivated crops it should be supplemented by the appropriate amount of superphosphate and potash salt.

## Pulverized Animal Manures.

MANUFACTURER.	BRAND.	Number of Samples.	TOTAL NITROGEN.		TOTAL PHOSPHORIC ACID.		TOTAL POTASH.		Organic Matter.	Moisture.
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
American Agricultural Chemical Co.	{ Pulverized Sheep and Goat Manure . Pulverized Sheep and Goat Manure .	6 2	1.73 1.42	1.23 1.25	1.08 1.02	1.00 1.00	3.55 3.21	2.00 2.00	38.50 32.00	21.10 16.65
Apothecaries Hall Co.	Sheep Manure . . . . .	2	1.37	1.65	.68	1.00	2.41	2.00	39.55	12.80
Armour Fertilizer Works . . . . .	Sheep and Goat Manure . . . . .	6	1.46	1.25	1.34	1.00	3.48	2.00	38.75	19.45
Atkins & Durbrow, Inc. . . . .	{ Driconure . . . . . Henure . . . . .	4 2	2.10 3.32	1.00 3.00	1.25 3.83	1.00 1.00	2.06 1.82	2.00 1.00	78.40 69.50	9.80 13.35
Joseph Breck & Sons Corp. . . . .	Ram's Head Brand Sheep Manure . . . . .	2	1.39	1.25	.83	1.00	2.52	2.00	39.85	8.45
Buell Fertilizer Co. . . . .	Buell Peat-Poultry Manure . . . . .	3	3.54	3.00	3.04	3.00	1.68	1.50	69.40	12.85
Collins Seed Service Co. . . . .	Collins Special Sheep Manure . . . . .	2	2.43	2.25	2.32	1.00	3.35	3.00	37.60	10.40
Consolidated Rendering Co. . . . .	{ Coreenco Sheep Manure . . . . . Coreenco Sheep Manure . . . . .	4 4	1.69 1.62	1.25 1.23	1.28 1.02	1.00 .50	3.82 3.46	2.00 2.00	38.45 38.95	22.05 19.35
Davey Tree Expert Co. . . . .	Davey Shredded Cattle Manure . . . . .	1	2.01	1.00	1.47	1.00	2.12	2.00	79.35	6.00
A. H. Hoffman, Inc. . . . .	{ Hoffman's Dehydrated Cow Manure . Hoffman's Sheep Manure . . . . .	3 3	2.18 1.97	2.00 1.85	1.72 1.15	2.00 1.00	2.04 2.42	2.00 2.00	79.50 51.40	5.95 5.75
International Agricultural Corp. . . . .	International Caribbee Sheep Manure . . . . .	5	1.34	1.02	1.30	.50	3.04	2.00	33.00	20.20
Natural Guano Co. . . . .	{ Sheep's Head Cattle Manure . . . . . Sheep's Head Pulverized Sheep Manure .	1 2	1.98 2.17	2.00 2.00	.89 1.02	1.00 1.00	2.38 3.60	2.00 2.00	63.20 70.05	5.45 7.25
Old Deerfield Fertilizer Co., Inc. . . . .	Pulverized Sheep and Goat Manure . . . . .	2	1.46	1.25	.83	1.00	2.27	2.00	44.95	5.65
Pacific Manure & Fertilizer Co. . . . .	Groz-It Brand Pulverized Sheep Manure . . . . .	2	1.44	1.25	.68	1.00	2.38	2.00	42.50	11.95
Premier Poultry Manure Co. . . . .	{ Premier Shredded Cattle Manure . . . . . Premier Pulverized Poultry Manure . . . . . Premier Pulverized Sheep Manure . . . . .	1 5 1	1.74 5.01 1.77	1.65 4.93 1.65	.96 2.28 3.78	.85 2.75 1.00	2.27 1.19 2.56	2.00 1.30 2.00	42.20 61.65 58.50	11.75 10.00 3.80

Pulverized Manure Co. . . . .	{ Wizard Brand Cow Manure . . . . . Wizard Brand Cow Manure . . . . . Wizard Brand Pulverized Sheep Manure . . . . .	1 1 3	2.03 2.29 2.03	2.00 2.00 2.00	1.31 1.25 1.66	1.00 1.00 1.00	1.98 2.64 4.25	1.00 1.00 2.00	64.95 64.70 70.55	6.50 9.40 6.75
John Reardon & Sons Co. . . . .	{ Rearco Domestic Sheep Manure . . . . . Rearco Domestic Sheep and Goat Ma- nure . . . . .	2 2	1.60 1.82	2.00 1.25	.96 1.08	1.00 1.00	2.54 2.65	2.00 1.75	45.80 46.30	7.05 6.40
Rogers & Hubbard Co. . . . .	{ Sheep and Goat Manure . . . . . Sheep and Goat Manure . . . . .	5 1	1.56 1.65	1.25 1.25	2.10 1.02	1.00 .75	3.37 3.36	2.00 2.00	36.85 35.25	14.30 9.25
F. Rynveld & Sons, Inc. . . . .	Moo Cow Natural Manure . . . . .	2	1.51	1.48	.93	.81	1.78	1.80	42.60	6.10
Van Horne Chemical Co., Inc. . . . .	Van Horne's Sheep Manure . . . . .	1	1.58	1.50	1.35	1.50	4.07	2.00	40.70	5.00
Walker-Gordon Laboratory Co., Inc. . . . .	Bovung . . . . .	5	2.04	2.00	2.23	2.00	2.02	2.00	77.20	6.15
W. W. Windle Co. . . . .	Sheep Manure Dusted from Wool . . . . .	1	1.99	1.75	.57	.38	5.35	5.70	44.55	3.15
Thomas Wood & Sons, Inc. . . . .	Woodgro Pure Cow Manure . . . . .	1	3.50	2.00	2.63	2.00	5.85	4.00	66.17	7.47



## Menderth

Manufactured by Menderth, Inc.

PLANT FOOD ELEMENTS.	GUARANTEED.	FOUND SOLUBLE IN STRONG HYDROCHLORIC ACID.
Potassium oxide . . . . .	3.00	1.38
Phosphoric acid . . . . .	.13	.13
Calcium oxide . . . . .	3.00	2.06
Magnesium oxide . . . . .	2.00	2.58

NOTE: The product contained .12% water soluble potassium oxide and 75.08% of insoluble matter. The commercial value of the plant food contained in one ton of the product, based upon its content of potash, phosphoric acid, calcium and magnesium, soluble in strong hydrochloric acid, would be about \$1.59. Any potash, phosphoric acid, calcium or magnesium that may be present in the product in a form insoluble in strong hydrochloric acid would have little or no value. For this reason a fusion test was not made for the total amount of these elements present.

DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZER FOR SALE  
IN MASSACHUSETTS IN 1936.

Acme Guano Co., 416 Munsey Bldg., Baltimore, Md.  
 American Agricultural Chemical Co., 285 River St., North Weymouth, Mass.  
 American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.  
 American Soda Products Co., 139 East Main St., Moorestown, N. J.  
 Apothecaries Hall Co., Waterbury, Conn.  
 Armour Fertilizer Works, 120 Broadway, New York, N. Y.  
 Ashcraft-Wilkinson Co., 601 Trust Company of Georgia Bldg., Atlanta, Ga.  
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.  
 Baker Castor Oil Company of Delaware, 120 Broadway, New York, N. Y.  
 Barrett Co., 40 Rector St., New York, N. Y.  
 Barrie Laboratories, Inc., 84 State St., Boston, Mass.  
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.  
 Baugh & Sons Co., 25 South Calvert St., Baltimore, Md.  
 Belmont Gardens, 170 Brighton St., Belmont, Mass.  
 Berkshire Chemical Co., 92 Howard Ave., Bridgeport, Conn.  
 Woodworth Bradley, Inc., 156 South Main St., Providence, R. I.  
 Brague, Inc., Hinsdale, Mass.  
 Joseph Breck & Sons Corp., 85 State St., Boston, Mass.  
 Buell Fertilizer Co., Newfields, N. H.  
 Cairo Meal and Cake Co., Cairo, Ill.  
 Chilean Nitrate Sales Corp., 120 Broadway, New York, N. Y.  
 Clay & Son, Ltd., Stratford, London, England.  
 Collins Seed Service Co., 131 Beverly St., Boston, Mass.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Davey Tree Expert Co., South Water St., Kent, Ohio.  
 Davison Chemical Corp., Rouse Bldg., Baltimore, Md.  
 Eastern States Farmers' Exchange, Springfield, Mass.  
 Thomas W. Emerson Co., 215 State St., Boston, Mass.  
 Ferti-Lawn Co., Inc., Hamilton, N. Y.  
 Florida Humus Co., Zellwood, Florida.  
 Flower City Plant Food Co., Inc., 24 Church St., Pittsford, N. Y.  
 Foodndrink Fertilizer Co., 221-A Mt. Auburn St., Cambridge, Mass.  
 Ford Motor Co., By-Products Sales Dept., 3674 Schaefer Road, Dearborn, Mich.  
 H. L. Frost & Higgins Co., 20 Mill St., Arlington, Mass.  
 Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.  
 Thomas J. Grey Co., 16 South Market St., Boston, Mass.  
 Dr. Heinz Co., College Hill Station, Cincinnati, Ohio.  
 Thomas Hersom & Co., New Bedford, Mass.  
 A. H. Hoffman, Inc., Landisville, Penn.  
 Hudson Valley Fuel Corp., P. O. Drawer No. 71, Troy, N. Y.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 International Agricultural Corp., 38 Chauncy St., Boston, Mass.  
 International Vegetable Oil Co., Inc., Memphis, Tenn.  
 Interstate Chemical Mfg. Co., Carbon Place, Jersey City, N. J.  
 John Joynt, Lucknow, Ontario, Canada.  
 Kelloggs & Miller, Inc., Amsterdam, N. Y.  
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo, N. Y.  
 L. B. Lovitt & Co., 1004 Falls Bldg., Memphis, Tenn.

Lowell Fertilizer Co., 178 Atlantic Ave., Boston, Mass.  
McClain Brothers Co., 263 Clark Bldg., Canton, Ohio.  
Master Meat Products Co., 2500 22nd St., Detroit, Mich.  
Menderth, Inc., 126 State St., Boston, Mass.  
Merrimac Chemical Co., Everett Station, Boston, Mass.  
Natural Guano Co., Aurora, Ill.  
New England Chemical Industries, Inc., 500 Fifth Ave., New York, N. Y.  
New England Rendering Co., Rear 39 Market St., Brighton, Mass.  
Old Deerfield Fertilizer Co., Inc., 28 Sugar Loaf St., South Deerfield, Mass.  
Olds & Whipple, Inc., 168 State St., Hartford, Conn.  
Pacific Manure & Fertilizer Co., 108-110 Davis St., San Francisco, Cal.  
F. G. Phillips Co., Circuit Road, Dedham, Mass.  
Plantabbs Corp., Baltimore, Md.  
Plantspur Products Co., Ridgefield, N. J.  
Premier Poultry Manure Co., 327 South LaSalle St., Chicago, Ill.  
Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago, Ill.  
John Reardon & Sons Co., 51 Waverly St., Cambridge, Mass.  
Rogers & Hubbard Co., Portland, Conn.  
Rose Manufacturing Co., 37th and Filbert Streets, Philadelphia, Penn.  
N. Roy & Son, Rear 618 Newport Ave., South Attleboro, Mass.  
F. Rynveld & Sons, Inc., 149 West 24th St., New York, N. Y.  
Salem Chemical & Supply Co., Salem, Mass.  
O. M. Scott & Sons Co., Marysville, Ohio.  
Sewerage Commission of the City of Milwaukee, P. O. Box 2079, Jones Island, Milwaukee, Wis.  
M. L. Shoemaker & Co., Inc., 3600 North Delaware Ave., Philadelphia, Penn.  
Soil Regenerator Corp., 120 Broadway, New York, N. Y.  
Standard Wholesale Phosphate & Acid Works, Inc., 1600 Mercantile Trust Bldg., Baltimore, Md.  
Stimulant Laboratories, Inc., 27-26 Jackson Ave., Long Island City, N. Y.  
Swift & Company Fertilizer Works, Standard Oil Bldg., Baltimore, Md.  
F. Sylvester & Son, 86 Baxter St., Melrose, Mass.  
Synthetic Nitrogen Products Corp., 285 Madison Ave., New York, N. Y.  
Tennessee Corp., Lockland, Ohio.  
Van Horne Chemical Co., Inc., 399 Halliday St., Jersey City, N. J.  
Victory Products Co., Norwood, Mass.  
Virginia-Carolina Chemical Corp., Richmond Trust Bldg., Richmond, Va.  
Vita-Vim Co., Cold Spring Lane & Western Maryland R. R., Baltimore, Md.  
Walker-Gordon Laboratory Co., Inc., Plainsboro, N. J.  
C. P. Washburn Co., Middleboro, Mass.  
E. E. Williams, 3 Church St., East Weymouth, Mass.  
W. W. Windle Co., 95 West Main St., Millbury, Mass.  
Winslow Nurseries, 1808 Great Plain Ave., Needham, Mass.  
Woodard Brothers, Greenfield, Mass.



# MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

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Control Series

Bulletin No. 85

October, 1936

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## Inspection of Commercial Feedstuffs

By Philip H. Smith

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This is the forty-second report of feeding stuffs inspection and presents the results of analysis of 1,801 samples of feeding stuffs intended for livestock and poultry consumption, collected during the year ending September 1, 1936. In addition will be found tables showing the physical and chemical analyses of 55 samples of oats found for sale in the Massachusetts markets.

The calcium and phosphorus content of chick starting and growing feeds collected during the past year is also shown.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.

# INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith<sup>1</sup>

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During the past year 1,045 brands of feed have been registered for sale by 208 manufacturers and dealers; 1,801 samples of feeding stuffs have been collected and subjected to analysis; 200 dealers, located in 106 towns, have been visited by the feed inspector at least once.

Work in connection with purchases of grain and feed for use in State institutions is increasing. Since September 1, 1935, over 100 such samples have been examined, in addition to many samples submitted by other departments of the State College.

In the attempt to have this publication carry information supplementary to that which merely complies with the feeding stuffs statute, information relative to the quality of whole oats offered for sale in Massachusetts, and the calcium and phosphorus content of proprietary chick and growing mash is also included.

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<sup>1</sup>The following staff members assisted in the inspection: Albert F. Spelman and John W. Kuzmeski, chemists; Frederick A. McLaughlin and Olive M. Hoefle, microscopists and seed analysts; James T. Howard, inspector, Cora B. Grover, clerk.

## Complete Average Analyses of Feeds Collected (Per Cent).

## I. UNMIXED BY-PRODUCTS.

(a) *Protein Feeds.*

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Cottonseed Meal.</b>										
3	Empire 41% Protein	E. T. Allen Co.	7.2	42.4	41.0	6.8	5.5	26.7	11.0	13.0	5.9
9	Cow-Eta Brand 41% Prime Quality	Ashecraft-Wilkinson Co.	7.4	42.7	41.0	5.9	5.0	27.1	10.9	13.0	6.0
4	Paramount Brand	Ashecraft-Wilkinson Co.	8.0	36.8	36.0	9.0	4.5	29.7	8.0	16.0	8.5
2	Miss Cairo Brand 36% Protein	Cairo Meal & Cake Co.	6.9	39.7	36.0	6.1	5.0	29.3	11.9	12.0	6.1
1	Eastern States 41% Protein	Eastern States Farmers' Exchange	7.2	41.5	41.0	5.9	6.0	28.8	9.7	10.0	6.9
1	Bull Brand 43% Protein	Humphreys-Godwin Co.	8.8	43.6	43.0	6.4	5.0	26.8	7.7	11.0	6.7
14	Dixie Brand Prime 41% Protein	Humphreys-Godwin Co.	7.5	41.5	41.0	6.3	5.0	27.6	11.2	12.0	5.9
2	High Grade	International Vegetable Oil Co., Inc.	7.1	40.2	41.0	6.7	6.0	28.1	11.7	10.0	6.2
2	Larowe 41% Protein	Larowe Milling Co.	7.6	41.4	41.0	6.3	6.0	30.0	8.1	10.0	6.6
9	"Lovit Brand" 41% Protein	L. B. Lovitt & Co.	7.7	40.9	41.0	6.2	5.0	27.6	11.8	13.0	5.8
3	"Lovit Brand" 36% Protein	L. B. Lovitt & Co.	7.6	40.0	36.0	7.6	4.5	28.3	10.7	16.0	5.8
3	41% Protein	Maurice Pincoffs Co.	7.6	41.6	41.0	6.5	5.0	27.3	11.4	14.0	5.6
1	Texas Bull Brand	Transit Milling Co.	8.9	41.1	41.0	6.4	5.0	26.8	11.0	11.0	5.8
	<b>Linseed Meal.</b>										
1	Pure Old Process 34% Protein	Archer-Daniels-Midland Co.	9.3	39.7	34.0	5.8	4.5	31.2	8.3	9.0	5.7
5	32% Pure Old Process	Archer-Daniels-Midland Co.	8.8	32.6	32.0	5.2	4.5	38.9	8.4	9.0	6.1
1	Kellogg's 34% Protein	Spencer Kellogg & Sons, Inc.	9.0	35.1	34.0	5.0	4.5	37.6	8.4	9.0	4.9
2	Kellogg's 32% Protein	Spencer Kellogg & Sons, Inc.	9.6	33.1	32.0	4.9	4.5	38.2	8.8	9.0	5.4
6	K & M Brand 34% Protein	Kelloggs & Miller, Inc.	9.9	33.7	34.0	5.6	5.0	35.3	8.6	10.0	5.9
1	K & M Brand 32% Protein	Kelloggs & Miller, Inc.	8.4	36.1	32.0	5.6	5.0	36.5	8.0	10.0	5.4
1	Pure Old Process 37% Protein	Sherwin-Williams Co.	10.2	38.0	37.0	5.0	4.5	34.1	7.1	9.0	5.6
2	Pure Old Process 34% Protein	Sherwin-Williams Co.	10.4	37.7	34.0	5.5	4.5	34.0	7.1	9.0	5.3
	<b>Soybean Oil Meal.</b>										
8	41% Protein	Allied Mills, Inc.	10.0	41.8	41.0	5.3	5.0	32.0	5.6	7.0	5.3
3	Super Soy	Allied Mills, Inc.	8.1	38.7	37.0	5.2	5.0	32.4	4.9	6.5	10.7
2	Central 41% Protein	Central Soya Co., Inc.	11.0	41.2	41.0	5.3	5.0	31.5	5.9	7.0	5.1
2	Soy Bean Oil Meal	Ralston Purina Co.	9.8	43.5	41.0	5.8	4.5	30.4	5.4	7.0	5.6
1	Shellabarger's	Shellabarger Grain Products Co.	9.7	40.8	41.0	6.0	4.5	31.9	6.1	7.5	5.5
4	Staley's	A. E. Staley Manufacturing Co.	7.9	42.9	41.0	5.1	4.5	32.6	6.1	7.0	5.4

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
I. UNMIXED BY-PRODUCTS — Continued.  
(a) Protein Feeds — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
<b>Gluten Meal.</b>											
2	Amazo	American Maize-Products Co.	9.5	44.0	40.0	1.5	1.0	42.1	1.7	4.0	1.2
6	Diamond	Corn Products Refining Co.	9.3	43.9	43.0	1.8	1.0	42.2	1.7	4.0	1.1
2	Douglas	Penick & Ford Ltd., Inc.	9.5	42.0	43.0	2.7	1.0	38.4	4.0	4.0	3.4
2	Union	Union Starch & Refining Co.	5.7	47.2	43.0	1.3	1.0	43.4	1.3	3.0	1.1
<b>Gluten Feed.</b>											
2	Cream of Corn	American Maize-Products Co.	8.7	29.7	25.0	3.2	2.0	44.4	7.0	8.5	7.0
3	Bacon's	Edward R. Bacon Grain Co.	8.1	27.3	24.0	4.0	2.0	50.1	7.3	8.0	3.2
1	Clinton	Clinton Co.	11.1	29.0	25.0	2.2	2.0	44.2	5.4	8.5	8.1
8	Buffalo	Corn Products Refining Co.	10.2	26.7	25.0	2.2	2.0	46.1	7.6	8.5	7.2
6	Heavy Buffalo (Sweetened).	Corn Products Refining Co.	11.7	22.1	20.0	1.6	1.0	51.5	6.6	7.0	6.5
3	Douglas	Penick & Ford Ltd., Inc.	11.4	25.9	25.0	2.6	1.5	46.6	7.3	8.5	6.2
7	Staley's	A. E. Staley Manufacturing Co.	10.3	31.4	25.0	2.1	1.0	41.2	6.0	8.0	9.0
5	Union	Union Starch & Refining Co.	9.6	28.3	25.0	2.1	1.0	47.9	6.3	8.0	5.8
<b>Distillers' Grains</b>											
1	Corn Distillers' Dried Grains	Allied Mills, Inc.	8.1	28.6	28.0	7.1	8.0	42.0	12.4	15.0	1.8
4	Corn 3D Grains	Dewey Bros. Co.	7.0	31.7	28.0	9.9	8.0	38.7	11.1	14.0	1.6
3	Corn Distillers' Dried Grains <sup>1</sup>	St. Albans Grain Co.	6.6	29.7	27.0	7.6	7.0	42.0	12.4	14.0	1.7
1	Corn Distillers' Dried Grains	St. Albans Grain Co.	3.2	31.4	28.0	7.8	7.0	43.8	12.1	14.0	1.7
1	Corn Distillers' Dried Grains	Hiram Walker & Sons, Inc.	5.9	33.6	28.0	10.7	6.0	34.5	14.0	13.0	1.3
2	W Corn Distillers Dried Grains	Wilber Feed Co., Inc.	7.4	29.3	28.0	9.7	8.5	39.2	12.7	13.0	1.7
<b>Brewers' Grains.</b>											
4	"Highquality"	Donahue-Stratton Co.	6.1	28.6	24.0	5.7	5.0	41.0	15.6	19.0	3.0
3	"Bull Brand"	Farmers Feed Co.	6.4	27.9	26.0	6.7	6.0	42.5	13.4	17.0	3.1
1	"Phoenix"	Great Eastern Feed Mills	7.2	31.2	28.0	6.2	6.0	40.1	12.1	15.0	3.2
3	"Neumond"	Neumond Co.	7.3	29.5	24.0	5.9	4.5	40.3	13.6	18.0	3.4
3	Brewers' Dried Grains	St. Albans Grain Co.	7.2	27.3	21.0	7.1	5.0	40.7	14.4	15.0	3.3
<b>Red Dog and Low Grade Flour</b>											
1	Sunfed Red Dog	Commander-Larabee Corp.	12.6	19.5	16.0	3.8	4.0	55.6	3.0	4.0	2.5

1	Genesota Red Dog	.	.	.	.	.	.	12.0	15.4	15.0	2.6	4.0	67.0	1.4	4.0	1.6
2	Wheat Red Dog	.	.	.	.	.	.	12.0	18.1	15.0	3.6	4.25	61.7	2.4	4.0	2.2
1	Hood-Red Arrow Flour Middlings	.	.	.	.	.	.	12.0	15.0	15.0	3.1	3.0	62.9	3.8	5.0	2.9
1	Moon's Fresh Ground Wheat Middlings	.	.	.	.	.	.	12.0	14.0	14.0	3.1	3.0	62.9	3.8	5.0	2.9
4	Choice Wheat Red Dog	.	.	.	.	.	.	12.0	15.0	14.0	1.7	2.85	69.5	0.8	7.5	1.0
1	XXX Comet — Reddog Flour	.	.	.	.	.	.	12.0	16.3	16.0	3.1	4.0	63.6	2.5	4.0	2.2
	Northwestern Consolidated Milling Div.	.	.	.	.	.	.	12.0	20.4	16.0	4.3	4.0	58.2	2.2	4.0	2.9
<b>Flour Middlings.</b>																
1	Moon's Fresh Ground Wheat Middlings	.	.	.	.	.	.	10.5	16.9	14.0	6.1	2.85	58.2	4.7	7.5	3.6
2	*Withmore Flour Middlings	.	.	.	.	.	.	12.0	17.5	15.0	4.0	4.0	58.6	4.4	6.0	3.5
<b>Wheat Standard Middlings</b>																
1	"C and C" Pure Shorts	.	.	.	.	.	.	12.0	15.3	16.0	4.5	5.0	56.8	7.2	8.0	4.2
3	Bronco Pure Shorts	.	.	.	.	.	.	11.9	18.6	16.0	5.7	5.0	51.4	8.1	8.0	4.3
2	*Washburn's Gold Medal Hard Wheat Standard Middlings	.	.	.	.	.	.	12.0	17.4	15.0	4.8	4.0	55.2	6.5	9.5	4.1
2	*Genesota Standard Wheat Middlings	.	.	.	.	.	.	13.9	19.9	15.0	5.9	4.0	50.4	6.2	9.5	3.7
1	*Wheat Standard Middlings	.	.	.	.	.	.	12.4	20.2	15.0	4.9	4.75	51.6	6.8	9.5	4.1
3	Moon's Fresh Ground Wheat Middlings	.	.	.	.	.	.	11.9	15.6	14.0	4.0	2.85	55.8	7.9	7.5	4.8
3	*Niagara Standard Wheat Middlings	.	.	.	.	.	.	12.3	18.5	15.5	5.1	4.5	52.6	7.2	7.0	4.3
1	*Niagara Standard Wheat Middlings	.	.	.	.	.	.	11.6	17.0	15.0	5.1	4.0	51.2	9.8	9.5	5.3
1	*Wheat Standard Middlings	.	.	.	.	.	.	13.2	16.6	15.0	5.2	5.0	53.7	7.2	8.0	4.1
1	Parrheim Pure Wheat Shorts	.	.	.	.	.	.	13.6	18.0	15.0	5.3	4.0	52.3	7.1	8.0	3.7
1	Bell Cow Wheat Shorts	.	.	.	.	.	.	12.1	19.1	15.0	5.8	4.0	49.8	8.7	9.5	4.5
3	Hard Wheat Occident Standard Middlings	.	.	.	.	.	.	12.3	16.7	17.5	5.1	4.0	56.3	5.7	7.0	3.9
1	Stock's Middlings	.	.	.	.	.	.	11.3	15.8	16.0	4.8	5.63	58.1	5.9	9.5	4.1
1	Stratton's Middlings	.	.	.	.	.	.	11.3	15.8	16.0	4.8	5.63	58.1	5.9	9.5	4.1
<b>Wheat Mixed Feed</b>																
1	*Burrus Wheat Mixed Feed	.	.	.	.	.	.	12.5	16.5	15.5	4.8	3.5	51.5	9.3	8.5	5.4
1	*Sunited Wheat Mixed Feed	.	.	.	.	.	.	12.5	17.3	15.0	4.4	4.0	54.0	7.3	8.5	4.5
2	Courcy's Heavy Mixed Feed	.	.	.	.	.	.	12.4	16.7	16.0	4.1	4.5	54.2	6.6	7.0	6.0
2	Full Value Mixed Feed	.	.	.	.	.	.	12.5	15.8	15.0	4.1	5.0	55.0	7.4	6.0	4.2
1	*Eshelman's Choice Mixed Feed	.	.	.	.	.	.	12.5	17.3	14.5	4.3	4.0	51.8	8.7	8.5	5.4
5	Pure Camel Fancy Wheat Feed	.	.	.	.	.	.	12.4	15.1	16.0	3.8	4.0	55.7	7.8	7.5	5.2
2	Royal Worcester Fancy Mixed Feed	.	.	.	.	.	.	12.5	16.0	16.0	5.2	3.5	53.0	7.0	7.0	4.3
3	*Washburn's Gold Medal Fancy Wheat Mixed Feed	.	.	.	.	.	.	12.5	18.0	16.0	5.2	3.5	53.0	7.0	7.0	4.3
3	Mixed Feed	.	.	.	.	.	.	12.3	16.2	15.0	4.0	3.5	56.9	6.3	7.5	4.3
3	Moon's Fresh Ground Mixed Feed	.	.	.	.	.	.	12.8	16.5	15.0	4.4	4.0	55.3	6.8	10.0	4.2
1	Planet Feed	.	.	.	.	.	.	12.8	19.1	15.0	4.7	4.0	53.6	5.3	8.0	4.5
2	*Wheat Mixed Feed	.	.	.	.	.	.	12.5	17.8	15.0	4.8	4.0	52.0	7.7	8.5	5.2
2	Park & Pollard Heavy Wheat Mixed Feed	.	.	.	.	.	.	13.0	17.4	15.5	4.5	3.35	53.5	7.2	8.0	4.4
1	*Pillsbury's Fancy Wheat Mixed Feed	.	.	.	.	.	.	12.5	17.8	15.0	4.4	4.0	54.2	6.9	8.5	4.2
1	*Buckeye Feed	.	.	.	.	.	.	12.5	16.4	15.5	4.3	4.5	54.3	7.1	10.0	5.4

11935 registration.

\*With screenings.

†Contains added salt and calcite flour.



## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## I. UNMIXED BY-PRODUCTS — Continued.

## (a) Protein Feeds — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
7	Wheat Mixed Feed — Concluded	Russell-Miller Milling Co.	12.5	18.0	15.0	5.4	4.5	51.4	7.8	9.5	4.9
4	*Wheat Occident Mixed Feed	St. Albans Grain Co.	12.8	15.9	15.0	4.3	3.75	53.6	7.5	8.0	5.1
2	*Litchfield Mixed Feed	F. W. Stock & Sons	12.5	16.7	16.0	4.4	4.0	55.5	7.0	8.0	4.7
2	*Stratton's Mixed Feed	Stratton & Co.	11.9	14.5	13.5	4.3	4.11	56.2	7.8	7.13	5.3
<b>Wheat Bran</b>											
1	Argentine Wheat Bran.	Bradley & Baker	13.0	15.0	13.0	3.8	4.0	50.6	11.0	13.0	6.6
1	*Wheat Bran	Burns Mill & Elevator Co.	13.0	15.6	15.0	4.4	3.5	49.0	11.0	10.0	7.0
3	Canadian Pure Bran	S. J. Cherry & Sons, Ltd.	13.5	15.8	15.0	4.8	3.5	50.5	10.1	11.5	5.3
3	"C and C" Pure Bran	Coatsworth & Cooper	13.2	15.7	15.0	4.3	3.5	51.6	9.8	11.5	5.4
1	*Sunfed Wheat Bran	Commander-Larabee Corp.	14.9	16.4	14.0	4.5	4.0	48.8	10.1	12.0	5.3
1	Copeland's "Dandy Bran"	Copeland Flour Mills, Ltd.	13.2	17.3	15.0	5.3	3.5	50.5	9.0	11.5	4.7
1	*Eagle Wheat Bran	Eagle Roller Mill Co.	13.0	15.8	14.0	5.0	4.0	48.7	11.2	12.0	6.3
1	*Wheat Bran	Fairchild Milling Co.	13.0	17.0	14.0	4.6	3.5	51.3	8.7	12.0	5.4
1	*Lucky Hard Wheat Bran	Federal Mill, Inc.	13.7	17.1	15.0	5.0	3.0	45.3	11.5	14.0	7.4
5	*Washburn's Gold Medal Hard Wheat Bran	General Mills, Inc.	13.1	16.2	14.0	4.8	4.0	50.7	9.8	12.0	5.4
1	Hamco Brand Wheat Bran	Frank B. Ham & Co., Ltd.	13.0	16.3	15.0	3.7	3.5	50.1	10.0	11.5	4.9
2	*Choice Wheat Bran	Hecker-Jones-Jewell Milling Div.	12.5	15.7	13.5	5.4	3.5	50.1	9.1	14.0	6.3
1	Blackhawk Wheat Bran	International Milling Co.	12.6	16.6	15.0	3.8	3.2	50.6	10.9	12.0	6.3
1	*Wheat Bran	Kimbell-Diamond Milling Co.	13.0	16.8	16.0	3.9	3.5	51.0	9.4	10.0	5.9
2	Lakewoods Wheat Bran	Lake of the Woods Millings Co., Ltd.	13.4	16.2	15.0	5.4	3.5	48.4	11.2	11.5	5.4
2	*Rex Wheat Bran	Maple Leaf Milling Co., Ltd.	13.0	16.2	15.0	5.1	3.0	49.5	11.2	12.0	5.0
2	*Moon's Wheat Bran	Geo. Q. Moon & Co., Inc.	13.2	17.6	15.0	4.6	3.0	53.6	6.5	10.0	4.5
5	Niagara Choice Wheat Bran	Niagara Falls Milling Co.	13.0	15.5	15.5	4.6	4.0	50.8	10.4	11.0	5.7
2	Pure Wheat Bran	Northwestern Consolidated Milling Div.	13.4	16.9	14.0	4.9	4.0	49.0	9.5	12.0	6.8
2	Ogilvie's Wheat Bran	Ogilvie Flour Mills Co., Ltd.	13.3	15.8	15.0	5.0	3.5	47.8	12.7	11.5	5.4
1	Parrheim Pure Wheat Bran	Parish & Heimbecker, Ltd.	13.3	14.9	15.0	5.2	3.5	50.7	10.5	11.5	5.4
4	*Pillsbury's Hard Wheat Bran	Pillsbury Flour Mills Co.	12.8	16.3	14.0	4.8	4.0	50.4	10.0	12.0	5.7
2	*Bell Cow Wheat Bran	Quaker Oats Co.	13.9	17.0	15.0	4.8	3.5	49.7	9.5	10.0	5.1
2	Hard Wheat Occident Bran	Russell-Miller Milling Co.	13.1	17.7	14.0	5.3	4.0	49.0	9.1	11.5	5.8
3	Dakota Maid Pure Bran	State Mill & Elevator	13.4	16.8	15.0	5.4	5.0	48.2	10.4	12.0	5.5
3	*Stock's Bran	F. W. Stock & Sons	13.4	14.6	17.5	3.3	4.0	54.4	8.8	10.0	5.5
1	*Stratton's Bran	Stratton & Co.	12.8	15.2	14.0	4.3	4.0	53.5	8.8	11.0	5.4
4	*Wheat Bran	Texas Star Flour Mills	12.8	15.3	15.0	4.2	4.0	50.8	10.7	10.5	6.2

(b) *Starchy Feeds*

Hominy Feed.		Acme-Evans Co.	11.7	9.8	10.0	6.1	7.0	66.6	3.6	6.0	2.2
1	Acme	Kellogg Co.	10.9	11.0	10.0	7.1	6.0	64.8	3.7	5.0	2.5
5	O-Corn-O	Kellogg Company of Canada, Ltd.	10.5	10.0	10.0	7.9	6.5	66.3	3.2	5.0	2.1
2	Badger White	Chas. A. Krause Milling Co.	11.6	11.5	10.0	6.5	6.0	62.9	4.7	5.0	2.8
5	Choice Steam Cooked	Miner-Hillard Milling Co.	11.8	11.4	10.0	6.7	5.0	63.1	4.2	5.0	2.8
4	Moon's	Geo. Q. Moon & Co., Inc.	12.1	11.1	10.0	10.2	5.0	59.0	4.6	6.0	3.0
2	Hominy Feed.	Patent Cereals Co.	11.5	11.9	10.0	7.2	5.0	61.8	4.3	5.0	3.3
2	Burt's	Post Products Div. of General Foods Corp.	10.7	12.2	10.0	7.4	6.0	61.4	5.2	5.0	3.1
2	Pratt's White.	Pratt Food Co., Inc.	12.7	10.7	10.0	6.5	5.0	64.3	3.2	6.0	2.6
3	White	Quaker Oats Co.	11.5	10.4	10.0	7.5	5.0	64.9	3.7	5.0	2.0
Dried Beet Pulp											
6	Dried Beet Pulp	Larowe Milling Co.	11.7	9.6	7.0	0.7	0.3	54.9	20.1	22.5	3.0
1	Dried Molasses-Beet Pulp	Larowe Milling Co.	11.0	9.3	7.0	0.4	0.3	60.5	12.8	20.0	6.0
2	Dried Beet Pulp	St. Albans Grain Co.	11.0	9.7	8.0	0.5	0.5	58.5	13.9	22.0	6.4
Rye Feed											
1	Irving Mills	Van Vechten Milling Co., Inc.	12.0	17.2	13.0	3.1	2.0	60.4	3.9	10.0	3.4
Oat Feed											
1	Oat Mill Feed	Checkerboard Elevator Co.	9.9	6.0	5.0	1.3	1.5	50.4	26.7	30.0	5.7
1	Oat Mill Feed	Hecker — H-O Co., Inc.	9.6	7.0	6.0	2.2	1.5	48.1	27.1	28.0	6.0
3	Vim Oat Mill Feed.	Quaker Oats Co.	7.6	5.9	5.0	2.0	1.5	49.8	29.1	30.0	5.6
2	Sugared Vim Oat Mill Feed	Quaker Oats Co.	9.9	5.1	5.0	1.7	1.25	52.5	25.1	27.5	5.7

## II. PREPARED FEEDS.

(a) *Protein Feeds.*

Dairy and Molasses Feeds (more than 15 per cent protein).		Allied Mills, Inc.	11.0	23.9	24.0	4.4	3.0	44.4	8.7	12.0	7.6
1	Empire 24% Dairy Ration	Allied Mills, Inc.	11.1	21.7	20.0	4.4	3.0	46.6	8.5	12.0	7.7
5	Empire 20% Dairy Ration	Allied Mills, Inc.	11.0	19.8	16.5	4.6	3.0	48.8	9.2	12.0	6.6
3	Empire 16% Dairy Ration	Allied Mills, Inc.	11.0	32.5	32.0	5.2	4.0	35.4	7.0	9.0	8.9
2	Wayne Amco 32% Supplement Dairy Ration	Allied Mills, Inc.	11.1	25.6	24.0	5.0	4.0	42.9	8.2	9.0	7.2
7	Wayne Amco 24% Dairy Ration	Allied Mills, Inc.	11.2	22.1	20.0	4.6	4.0	46.7	8.5	9.0	6.9
8	Wayne Amco 20% Dairy Ration	Allied Mills, Inc.	11.5	16.4	16.0	4.3	3.5	54.9	6.9	8.0	6.0
2	Wayne Amco 16% Dairy Ration	Allied Mills, Inc.	10.8	21.7	20.0	4.0	4.0	46.9	9.8	10.0	6.8
1	Ames 20% Milk Maker	A. P. Ames Co.	11.0	23.6	20.0	4.1	4.0	42.6	8.7	9.0	10.0
1	20% Balanced Ration	A. P. Ames Co.	11.0	23.6	20.0	4.1	4.0	42.6	8.7	9.0	10.0
3	Academy 24% Open Formula Production Ration.	Academy Farms Milling Co.	11.2	23.9	24.0	2.8	4.0	45.6	7.5	9.0	9.0

\*With screenings.

## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## II. PREPARED FEEDS — Continued.

## (a) Protein Feeds — Continued.

Num- ber of Sam- ples	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
7	Dairy and Molasses Feeds (more than 15 per cent protein) — Continued										
	Academy 20% Open Formula Production Ration.	Academy Farms Milling Co.	11.3	20.4	20.0	3.0	3.5	47.3	8.5	9.0	9.5
1	Arco 24% Dairy Ration	Academy Farms Milling Co.	11.0	24.0	24.0	3.2	3.5	44.7	7.6	11.0	9.5
3	Old Colony Feed	Academy Farms Milling Co.	11.1	20.2	20.0	3.2	3.5	46.2	9.6	11.0	9.7
5	Peerless Milk Ration	Academy Farms Milling Co.	11.2	19.9	20.0	3.1	3.5	44.3	10.9	12.0	10.6
1	Our 20% Special Dairy Ration	E. W. Bailey & Co.	11.0	21.8	20.0	4.6	3.5	46.3	9.3	9.0	7.2
1	Big Ben Brand 20% Dairy Feed	Barber & Bennett, Inc.	12.7	21.8	20.0	4.6	3.5	45.5	8.0	12.0	7.4
1	Double Value 24% Dairy Feed	Barber & Bennett, Inc.	11.0	23.1	24.0	4.5	4.0	46.3	6.6	8.5	5.5
1	Double Value 20% Dairy Feed	Barber & Bennett, Inc.	11.0	23.2	20.0	4.5	4.0	47.9	6.5	8.5	6.9
1	Auburn Brand Auburn Dairy Feed	Beacon Milling Co., Inc.	11.0	22.1	20.0	3.7	4.0	49.1	7.5	10.0	6.6
1	Beacon Dairy Ration	Beacon Milling Co., Inc.	11.4	24.1	24.0	4.5	4.5	45.6	7.9	9.0	6.8
2	Beacon Sweet "24"	Beacon Milling Co., Inc.	11.7	25.4	24.0	3.9	4.0	44.7	7.5	9.0	6.5
2	Beacon Sweet "20"	Beacon Milling Co., Inc.	11.9	21.0	20.0	3.8	4.0	49.1	7.7	9.0	6.5
2	Berkshire Hills Sweet Dairy Feed	Berkshire Coal & Grain Co., Inc.	11.1	20.8	20.0	4.2	4.5	48.4	8.3	8.0	7.2
2	Green Mountain Dairy Ration	Berkshire Coal & Grain Co., Inc.	10.8	24.1	23.0	4.8	5.0	45.9	8.0	10.0	6.4
2	Borden's Dairy Feed	Borden Grain Co.	10.6	24.6	22.0	5.6	4.5	46.0	6.6	10.0	6.6
2	Brown's Dairy Feed	Geo. B. Brown	10.8	21.2	20.0	4.1	4.0	46.6	9.8	12.0	7.5
2	Community - 20 Dairy Ration	Community Feed Stores, Inc.	11.1	21.2	20.0	5.2	4.5	49.1	7.2	11.5	6.2
2	Hilltop - 20 Dairy Ration	Community Feed Stores, Inc.	10.9	21.0	20.0	4.5	4.0	45.9	10.7	11.5	7.0
2	Cowaco's Dairy Feed	Nicolas Courcy Grain Co.	10.6	23.1	22.0	4.9	4.5	49.3	6.5	7.0	5.6
2	Coweco 1925 Ration	E. A. Cowee Co.	11.1	24.2	24.0	4.8	4.5	44.3	8.4	10.0	7.2
2	Coweco 20% Ration	E. A. Cowee Co.	10.8	22.9	20.0	4.0	3.0	45.4	8.8	10.0	8.1
2	Coweco Sunray 20% Dairy Ration	E. A. Cowee Co.	11.0	21.8	20.0	4.3	3.5	46.7	9.0	10.0	7.2
4	Dairy-Aide 24% Ration	E. A. Cowee Co.	10.9	22.1	24.0	4.5	4.0	43.8	10.8	11.0	7.9
1	Crystal 24% Dairy Ration	E. A. Cowee Co.	11.0	22.0	20.0	4.0	4.0	42.6	12.5	11.0	7.9
1	Crystal 20% Dairy Ration	Curley Brothers	11.0	24.7	24.0	4.8	5.0	44.6	7.7	9.0	7.5
2	King 20% Dairy Feed Sweetened	Curley Brothers	11.0	21.6	20.0	4.4	4.0	45.5	9.5	12.0	8.0
1	Delaware Sweet 24% Dairy Feed	Cutler Co.	11.0	20.4	20.0	4.2	4.5	50.7	7.2	8.0	6.5
1	Delco 20% Dairy Feed	Delaware Mills, Inc.	11.6	24.3	24.0	4.7	4.5	44.1	6.8	9.0	8.5
1	Delco Sweet 20% Dairy Feed	Delaware Mills, Inc.	11.7	20.9	20.0	3.8	4.0	46.2	8.7	11.0	8.7
3	Delco Sweet 20% Dairy Feed	Delaware Mills, Inc.	11.9	21.2	20.0	4.2	4.5	46.7	8.1	10.0	7.9
4	Indian Sweet 20% Dairy Feed	Delaware Mills, Inc.	12.1	22.1	20.0	3.7	4.0	42.8	11.2	12.0	8.1

## INSPECTION OF COMMERCIAL FEEDSTUFFS

22	Diauto's Dairy Feed	.	.	.	.	.	.	.	Frank Diauto	11.4	18.0	17.0	4.4	3.92	51.9	8.9	7.74	5.4
21	Diehl's Dairy Feed	.	.	.	.	.	.	.	F. Diehl & Son, Inc.	10.7	18.9	18.0	3.7	3.0	44.7	11.0	14.0	8.0
20	D. & G. Dairy Feed	.	.	.	.	.	.	.	Dietrich & Gambrell, Inc.	12.7	19.9	20.0	4.2	4.0	47.7	10.4	12.0	8.1
19	Gambrell's 16% Dairy Feed	.	.	.	.	.	.	.	Dietrich & Gambrell, Inc.	11.0	16.3	16.0	4.0	3.5	47.0	12.1	12.0	9.8
18	Pen Mar Dairy Feed	.	.	.	.	.	.	.	Dietrich & Gambrell, Inc.	11.0	21.5	20.0	4.4	4.0	47.0	8.2	9.0	7.9
17	Excel 20% Dairy Ration	.	.	.	.	.	.	.	J. L. Dunnell & Son	11.0	21.0	20.0	4.2	4.5	49.1	8.2	10.0	6.5
16	Special Dairy Feed	.	.	.	.	.	.	.	East Bridgewater Farmers' Exchange	12.5	21.9	20.0	4.2	4.0	49.0	7.3	9.0	5.1
15	Eastern 24% Dairy Ration Sweetened	.	.	.	.	.	.	.	Eastern Grain Co.	12.5	23.2	24.0	4.0	4.0	46.5	7.2	9.0	6.6
14	Eastern 20% Dairy Ration Sweetened	.	.	.	.	.	.	.	Eastern Grain Co.	11.9	22.0	20.0	3.9	4.0	48.7	7.6	9.0	6.0
13	Eastern States Ruppall Dairy Ration	.	.	.	.	.	.	.	Eastern States Farmers' Exchange	11.8	20.8	20.0	5.1	4.5	49.4	7.0	8.5	5.8
12	Eastern States Highland 20 Dairy Ration	.	.	.	.	.	.	.	Eastern States Farmers' Exchange	11.0	21.3	20.0	4.6	4.0	46.4	10.2	11.5	6.5
11	Eastern States Highland 16 Dairy Ration	.	.	.	.	.	.	.	Eastern States Farmers' Exchange	11.0	16.9	16.0	4.6	4.0	51.9	9.4	11.0	6.2
10	Eastern States Highland 12	.	.	.	.	.	.	.	Eastern States Farmers' Exchange	11.8	13.4	12.0	3.9	3.0	54.5	9.9	11.0	6.3
9	Eastern States Milkhead Dairy Ration	.	.	.	.	.	.	.	Eastern States Farmers' Exchange	11.4	26.4	24.0	5.1	4.5	43.3	7.5	9.0	6.3
8	Eastern States Sixteen Dairy Ration	.	.	.	.	.	.	.	Eastern States Farmers' Exchange	12.0	17.9	16.0	5.0	4.0	52.5	7.0	8.0	5.6
7	Eastern States 32% Supplement Feed	.	.	.	.	.	.	.	Eastern States Farmers' Exchange	10.6	32.5	32.0	4.8	4.5	37.3	6.7	8.0	8.1
6	The Ellis Dairy Feed	.	.	.	.	.	.	.	Michael W. Ellis	11.3	24.5	22.0	4.6	4.0	46.1	7.4	9.0	6.1
5	Dairymans Emergency Ration	.	.	.	.	.	.	.	Elmore Milling Co., Inc.	11.3	20.5	20.0	4.8	3.0	45.1	11.1	12.0	7.2
4	Elmore Milk Grains	.	.	.	.	.	.	.	Elmore Milling Co., Inc.	10.9	25.2	24.0	4.7	4.5	44.4	9.2	10.0	5.6
3	Elmore Milk Grains Junior 20%	.	.	.	.	.	.	.	Elmore Milling Co., Inc.	10.9	22.4	20.0	5.0	4.5	48.7	7.8	10.0	5.2
2	Elmore Milk Grains Junior Sweet	.	.	.	.	.	.	.	Elmore Milling Co., Inc.	11.0	22.4	20.0	4.7	4.5	47.9	7.6	10.0	6.4
1	Elmore's Sweet Digesto Dairy Feed	.	.	.	.	.	.	.	Elmore Milling Co., Inc.	11.9	16.9	16.0	4.0	4.0	47.8	12.3	12.0	7.1
0	Emco Feed	.	.	.	.	.	.	.	Elmore Milling Co., Inc.	11.1	22.1	20.0	4.2	4.5	47.9	8.6	10.0	6.1
9	Granger 20% Dairy Ration	.	.	.	.	.	.	.	Elmore Milling Co., Inc.	11.4	21.6	20.0	4.2	4.0	46.6	9.3	11.0	6.9
8	Waldorf 20% Ration	.	.	.	.	.	.	.	Elmore Milling Co., Inc.	11.9	21.8	20.0	4.5	4.0	44.1	11.0	11.0	7.5
7	Eselman Challenge Dairy Feed	.	.	.	.	.	.	.	John W. Eselman & Sons	10.9	23.9	24.0	4.6	4.0	44.5	8.1	11.0	8.0
6	Eselman Conestoga 20 Dairy Feed	.	.	.	.	.	.	.	John W. Eselman & Sons	11.1	21.0	20.0	4.2	4.0	47.1	8.7	11.0	7.9
5	Eselman Lancaster 20 Dairy Feed	.	.	.	.	.	.	.	John W. Eselman & Sons	11.0	23.6	20.0	4.5	4.0	43.7	8.8	11.0	8.4
4	Eselman 32% Mixing Ration	.	.	.	.	.	.	.	John W. Eselman & Sons	11.0	31.7	32.0	4.1	4.5	37.8	8.1	9.0	7.3
3	Eselman Pennsay 16 Dairy Feed	.	.	.	.	.	.	.	John W. Eselman & Sons	11.0	17.9	16.0	3.6	3.0	48.6	9.9	11.0	9.0
2	Eselman Red Rose 24 Dairy Feed	.	.	.	.	.	.	.	John W. Eselman & Sons	11.0	24.8	24.0	4.1	4.0	43.2	8.1	11.0	8.3
1	C Dairy Feed	.	.	.	.	.	.	.	Farm Service Stores, Inc.	11.0	21.5	21.0	5.7	5.0	46.2	8.1	9.0	7.5
0	Diamond A Dairy Ration	.	.	.	.	.	.	.	Farm Service Stores, Inc.	10.0	23.3	24.0	3.9	5.0	45.7	10.6	8.0	6.5
9	Diamond C Dairy Feed	.	.	.	.	.	.	.	Farm Service Stores, Inc.	11.1	21.7	21.0	3.8	5.0	46.1	10.3	10.0	7.0
8	18-20 Dairy Ration	.	.	.	.	.	.	.	Farm Service Stores, Inc.	11.1	19.7	18.0	3.8	3.5	45.6	12.8	13.0	7.0
7	Lawrence Cow Ration	.	.	.	.	.	.	.	Farm Service Stores, Inc.	11.0	18.7	20.0	4.0	4.0	49.2	10.8	12.0	6.3
6	New England Dairy Ration	.	.	.	.	.	.	.	Farm Service Stores, Inc.	11.0	21.0	20.0	3.5	3.0	43.3	14.1	11.5	7.0
5	North Star 24% Dairy Feed	.	.	.	.	.	.	.	Farm Service Stores, Inc.	11.0	20.0	20.0	3.8	4.0	45.9	8.8	11.0	6.7
4	North Star 20% Dairy Feed	.	.	.	.	.	.	.	Farm Service Stores, Inc.	11.5	20.3	24.0	3.8	4.5	48.1	9.1	12.0	7.2
3	North Star 16% Dairy Feed	.	.	.	.	.	.	.	Farm Service Stores, Inc.	11.0	17.2	16.0	3.4	3.0	50.8	10.6	11.0	7.0
2	Flory's Dairy Feed	.	.	.	.	.	.	.	Flory Milling Co., Inc.	10.5	24.8	24.0	3.9	4.5	42.5	10.6	11.0	7.7
1	Flory's 24% Special Dairy Feed	.	.	.	.	.	.	.	Flory Milling Co., Inc.	10.2	24.8	24.0	4.7	3.5	43.1	10.4	10.0	6.8
0	Flory's 20% Special Dairy Feed	.	.	.	.	.	.	.	Flory Milling Co., Inc.	10.3	20.6	20.0	4.4	3.5	47.5	10.2	11.0	7.0
9	National Dairy Feed	.	.	.	.	.	.	.	Flory Milling Co., Inc.	11.0	16.6	16.0	3.5	3.5	50.9	10.3	12.0	7.7
8	Record Dairy Feed	.	.	.	.	.	.	.	Flory Milling Co., Inc.	10.9	19.3	20.0	3.8	4.5	49.5	9.2	9.0	7.3
7	Garland's 24% Ration	.	.	.	.	.	.	.	J. B. Garland & Son	11.0	24.4	24.0	4.5	4.5	45.9	7.3	10.0	6.9
6	Garland's Economy 20% Dairy Ration	.	.	.	.	.	.	.	J. B. Garland & Son	12.0	22.2	20.0	3.7	3.5	47.6	7.9	9.0	6.6

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 II. PREPARED FEEDS — Continued.  
 (a) Protein Feeds — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Dairy and Molasses Feeds (more than 15 per cent protein) — Continued</b>										
1	Royal Worcester Complete Ration	J. B. Garland & Son	11.0	20.5	20.0	3.9	3.0	48.4	9.0	10.0	7.2
2	Eventually Gold Medal Dairy Ration	General Mills, Inc.	11.0	22.6	20.0	4.2	4.5	46.9	7.9	8.5	7.4
2	Grandin's 24% Balanced Dairy Ration	D. H. Grandin Milling Co.	11.0	24.0	24.0	5.4	5.0	42.5	8.8	10.0	7.9
1	Grandin's Sweetened 24% Dairy Feed	D. H. Grandin Milling Co.	11.0	27.0	24.0	4.1	4.0	44.1	6.5	10.0	7.3
2	Grandin's Sweetened 20% Dairy Feed	D. H. Grandin Milling Co.	12.1	21.1	20.0	4.6	4.0	48.3	6.4	10.0	7.5
2	Grandin's Milk Maker	D. H. Grandin Milling Co.	11.0	22.8	20.0	5.2	5.0	45.9	7.7	12.0	7.4
4	Grandin's 12-Twin Six-12 Dairy Feed	D. H. Grandin Milling Co.	11.2	22.0	22.0	5.1	5.0	47.9	7.5	13.0	7.3
1	M-S (Money Saver) 24% Sweetened Dairy Feed	D. H. Grandin Milling Co.	10.7	23.9	24.0	3.8	3.5	41.4	10.9	12.0	9.3
1	M-S (Money Saver) 20% Sweet Dairy Feed	D. H. Grandin Milling Co.	11.0	21.6	20.0	3.8	4.0	46.0	11.0	12.0	6.6
3	Daily Milk Dairy Feed	Great Atlantic & Pacific Tea Co.	11.3	19.7	16.0	3.7	4.0	47.9	8.4	12.0	9.0
2	Milky Way Dairy Feed 24%	Great Atlantic & Pacific Tea Co.	11.1	24.5	24.0	2.9	4.0	44.7	9.5	9.0	7.3
4	Milky Way Dairy Feed 20%	Great Atlantic & Pacific Tea Co.	11.3	22.7	20.0	2.9	3.5	46.9	8.6	9.0	7.6
2	"Phoenix" 24 Dairy Ration	Great Eastern Feed Mills	10.5	24.9	24.0	5.1	5.0	44.3	8.2	9.0	7.2
2	"Phoenix" 20 Dairy Ration	Great Eastern Feed Mills	10.7	21.9	20.0	5.3	4.5	46.5	8.3	9.0	7.3
2	Sugared "Phoenix" Feed	Great Eastern Feed Mills	10.1	15.4	10.0	4.2	3.0	52.3	11.9	13.0	6.1
1	Welcome Dairy Feed	D. Harbeck	11.2	25.0	20.0	4.2	4.0	48.0	6.5	10.0	5.1
2	Hodgkins' Dairy Ration	D. B. Hodgkins' Sons	11.7	21.1	19.0	4.8	4.5	47.1	8.7	10.0	6.7
2	Hodgkins' Milk Ration	D. B. Hodgkins' Sons	11.7	21.0	19.0	4.0	3.5	45.8	11.0	13.0	6.4
1	Wantmore 24% Sweetened Dairy Ration.	Horvitz Grain Co.	11.0	24.4	24.0	3.7	3.5	47.2	6.6	9.0	6.7
1	Wantmore Sweetened Special Dairy 24%	Horvitz Grain Co.	10.8	24.7	24.0	4.5	4.0	41.2	12.5	13.0	6.3
1	Wantmore Sweetened Special Dairy 20%.	Horvitz Grain Co.	10.6	21.6	20.0	4.4	4.0	44.1	12.5	13.0	6.8
1	Wantmore Dairy Ration	Horvitz Grain Co.	11.0	23.7	20.0	5.3	4.0	46.5	7.2	10.0	6.3
1	Wantmore Dairy Ration with Beet Pulp	Horvitz Grain Co.	10.8	21.8	20.0	4.8	4.0	47.5	8.5	10.0	6.6
2	Wantmore 20% Sweetened Dairy Ration	Horvitz Grain Co.	11.0	20.8	20.0	4.5	3.5	50.7	6.0	8.5	7.0
3	Dairy Ration	Jaquith & Co.	11.6	21.1	20.0	4.8	4.0	46.1	9.4	8.0	6.3
1	Just Right Dairy Ration 24%	Jersee Co.	11.9	23.8	24.0	5.1	4.5	44.7	8.2	9.0	6.3
1	Just Right Dairy Ration 16%	Jersee Co.	12.1	17.2	16.0	4.8	4.0	51.9	7.8	9.0	6.2
2	Apex 20% Dairy Ration	Kasco Mills, Inc.	11.0	24.4	22.0	3.4	3.5	44.2	8.5	12.0	8.0
3	Beatsall Milk Grains	Kasco Mills, Inc.	12.4	23.9	22.0	4.3	4.0	44.6	6.8	10.0	8.5
1	Kasco 18% Dairy Ration	Kasco Mills, Inc.	11.0	21.8	18.0	4.4	3.5	47.5	7.7	10.0	7.6
2	Kasco 20% Milk Maker	Kasco Mills, Inc.	10.9	24.3	20.0	4.4	4.0	46.4	8.7	11.0	5.3

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Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 II. PREPARED FEEDS — Continued.  
 (a) Protein Feeds — Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Dairy and Molasses Feeds (more than 15 per cent protein) — Concluded</b>										
6	Purina Green Checker Cow Chow (24%)	Ralston Purina Co.	11.1	25.8	24.0	4.7	4.0	40.6	10.5	12.0	7.3
1	Purina Milking Cow Chow (20%)	Ralston Purina Co.	11.5	21.4	20.0	4.8	4.0	46.0	9.0	12.0	7.3
1	Purina Milking Cow Chow (34%)	Ralston Purina Co.	11.0	35.8	34.0	4.0	3.5	33.4	7.5	12.0	8.3
1	Riley's 20% Ration	D. F. Riley	11.0	21.5	20.0	4.6	4.5	48.5	8.0	9.0	6.4
1	Ropes' Balanced Ration	R. W. Ropes	11.0	21.4	22.0	4.8	5.0	47.9	8.9	10.0	6.0
1	Ropes' Sweet Ration	R. W. Ropes	11.0	21.4	20.0	4.7	5.0	49.3	8.8	10.0	5.8
2	Blue Tag Dairy Ration	Ryther & Warren	11.4	22.6	20.0	4.5	4.5	47.0	8.9	10.0	5.6
2	Minot Special Dairy Ration	Ryther & Warren	11.4	22.0	20.0	5.2	4.5	48.1	8.3	10.0	5.0
2	Hygrade 24 Sweetened Milk Ration	St. Albans Grain Co.	11.5	25.4	24.0	3.4	3.5	45.7	6.0	9.0	8.0
1	Hygrade 20 Sweetened Milk Ration	St. Albans Grain Co.	12.0	21.6	20.0	3.5	3.5	49.8	6.6	8.5	6.5
6	Utility 20 Dairy Ration	St. Albans Grain Co.	11.2	20.5	20.0	3.5	3.5	47.5	9.7	12.0	7.6
1	Utility 16 Dairy Ration	St. Albans Grain Co.	11.0	16.4	16.0	3.1	3.0	48.8	13.4	13.0	7.3
5	Wirthmore 25 Balanced Ration Sweetened	St. Albans Grain Co.	11.4	26.0	25.0	4.3	4.5	43.8	7.6	8.5	6.9
2	Wirthmore 20 Dairy Feed Sweetened	St. Albans Grain Co.	11.6	20.9	20.0	4.4	4.5	49.7	6.9	8.0	6.5
1	Wirthmore 16 Dairy Ration Sweetened	St. Albans Grain Co.	11.0	17.6	16.0	4.6	4.0	55.3	5.9	8.0	5.6
1	The Ideal Dairy Ration	C. H. Symmes & Co.	13.7	20.2	20.0	4.0	3.5	48.1	7.1	8.5	6.9
1	Syracuse Dairy Feed	Syracuse Milling Co.	10.2	25.4	24.0	4.9	4.5	44.4	9.6	12.0	5.5
1	E-Gee Dairy Feed	Tioga Mills, Inc.	11.0	20.5	20.0	4.7	3.5	46.2	10.6	10.0	7.0
1	Red Brand Tioga Dairy Feed	Tioga Mills, Inc.	11.0	25.6	24.0	4.2	4.5	44.4	7.6	10.0	7.2
1	United Farmers Milk Maker	United Cooperative Farmers, Inc.	11.0	20.8	20.0	4.1	4.0	49.8	8.2	8.0	6.1
1	United Farmers Milk Pep	United Cooperative Farmers, Inc.	11.0	25.5	24.0	4.5	4.5	43.5	8.3	8.0	7.2
1	Unity 20% Dairy Ration	Unity Feeds, Inc.	11.8	23.0	20.0	4.0	4.5	46.7	7.2	9.0	7.3
1	Ventura's Dairy Feed	Arthur Ventura Grain Co.	12.3	21.4	20.0	4.8	4.5	49.3	7.2	8.0	5.0
2	Made-Right Balanced Ration	C. P. Washburn Co.	11.3	24.5	22.0	4.7	5.0	47.2	6.9	10.0	5.4
2	Made-Right 16% Dairy Feed	C. P. Washburn Co.	11.0	21.1	16.0	4.4	4.0	49.5	7.9	9.0	6.1
3	Made-Right Sweet Dairy Feed	C. P. Washburn Co.	11.3	22.8	20.0	4.9	4.0	47.6	7.3	8.0	6.1
2	Galen 24% Dairy Feed	Wayne County Grangers Feed Corp.	11.6	24.4	24.0	3.5	4.0	45.3	7.9	10.0	7.3
2	Superior 20% Dairy Feed	Wayne County Grangers Feed Corp.	11.8	21.8	20.0	3.5	4.0	47.9	7.9	10.0	7.1
1	Sweetened 16% Dairy Feed	Wayne County Grangers Feed Corp.	12.9	18.7	16.0	3.7	4.0	50.4	7.2	12.0	7.1
2	Blue Seal -20% Dairy Ration	H. K. Webster Co.	11.7	21.5	20.0	4.3	4.5	48.2	7.5	7.5	6.8
2	Blue Seal Hom-Mix 24% Dairy Ration	H. K. Webster Co.	11.3	25.5	24.0	4.5	5.0	42.5	9.8	9.0	6.4
2	Blue Seal Improved Balanced Ration	H. K. Webster Co.	11.5	24.8	24.0	4.3	4.5	45.9	7.0	8.5	6.5

		H. K. Webster Co.	11.2	22.3	20.0	4.7	4.5	45.9	9.0	10.0	6.9
2	Blue Seal Special 20% Dairy Ration	West-Nesbitt, Inc.	11.3	21.8	20.0	4.3	4.0	50.4	7.5	10.0	4.7
1	Pure Feed Dairy Ration	West-Nesbitt, Inc.	10.9	21.6	20.0	3.8	3.0	50.4	7.5	10.0	5.8
2	Special 20% Dairy Ration	West-Nesbitt, Inc.	10.4	25.2	24.0	3.8	4.5	45.6	8.1	10.0	6.9
2	Super Pure Sweetfeed Dairy Ration	West-Nesbitt, Inc.	11.0	17.5	16.0	3.0	3.0	48.7	12.3	14.0	7.5
1	Uniform Sweet Dairy Ration	Est. M. G. Williams	10.7	22.5	20.0	4.9	4.0	47.1	8.0	12.0	6.8
2	Williams Balanced Ration	Stanley Wood Grain Co.	11.0	23.2	22.0	4.9	5.0	46.5	6.7	10.0	7.7
2	Bliss Dairy Ration	Stanley Wood Grain Co.	12.6	19.0	20.0	3.9	3.0	50.2	7.1	12.0	7.2
2	Woods Dairy Ration										
<b>Calf Meals.</b>											
1	Calf Manna	Albers Bros. Milling Co.	8.2	26.6	25.0	5.8	4.0	48.8	2.9	5.0	7.7
5	Wayne Calf Meal	Allied Mills, Inc.	10.2	26.0	24.0	4.8	4.0	45.8	6.2	7.0	7.0
3	Eastern States Calf Starter	Eastern States Farmers' Exchange	10.8	24.7	23.0	6.9	3.5	49.3	3.4	4.0	4.9
1	Elmore "Three Point" Calf Meal	Elmore Milling Co., Inc.	12.5	26.9	24.0	3.9	4.0	48.4	4.4	4.0	3.9
1	B B Bull Brand Calf Meal	Maritime Milling Co., Inc.	10.0	25.4	22.0	5.5	4.0	48.7	4.3	5.0	6.1
1	Milkade Calf Meal	Park & Pollard Co.	10.0	27.2	20.0	6.8	7.0	39.0	6.1	6.5	10.9
1	Schunacher Calf Meal	Quaker Oats Co.	10.0	19.1	18.0	7.9	7.0	54.1	3.7	4.0	5.2
2	Purina Calf Starting Chow	Ralston Purina Co.	10.5	29.4	27.0	4.2	3.2	45.4	4.0	5.0	6.5
1	Wirthmore Calf Meal	St. Albans Grain Co.	10.0	26.5	24.0	6.3	5.5	49.0	3.9	4.0	4.3
<b>Hog Feeds.</b>											
1	Wayne Pork Maker	Allied Mills, Inc.	11.5	15.1	14.0	5.1	3.5	57.4	5.2	7.0	5.7
3	Eastern States Hog Meal	Eastern States Farmers' Exchange	11.6	15.5	14.5	5.9	4.0	56.7	3.1	4.5	7.2
2	Eshelman Red Rose Hog Meal	John W. Eshelman & Sons	11.5	19.6	16.0	4.7	5.0	48.3	7.9	10.0	8.0
2	"Phoenix" 15% Hog Meal	Great Eastern Feed Mills	11.6	17.4	15.0	4.8	4.0	53.4	4.1	6.0	8.7
1	Larroe Pig Feed	Larroe Milling Co.	12.3	18.1	17.5	4.1	4.0	51.6	6.4	7.5	7.5
1	B B Bull Brand Pig & Hog Meal	Maritime Milling Co., Inc.	11.5	19.7	18.0	5.9	4.0	43.2	8.7	8.0	11.0
1	Wirthmore Pig and Hog	St. Albans Grain Co.	11.5	17.5	17.0	4.8	4.0	51.1	5.7	9.0	9.4

## (b) Starchy Feeds

Fitting and Pasture Rations.											
4	Wayne Amco 12% Fitting Ration	Allyed Mills, Inc.	13.2	13.8	12.0	4.6	3.0	56.0	5.8	9.0	6.6
2	Arcaay Fitting Ration	Arcaay Farms Milling Co.	13.5	13.0	12.0	2.9	3.5	50.3	9.0	7.0	11.3
5	Eastern States Fitting Ration	Eastern States Farmers' Exchange	13.1	15.1	12.0	5.3	3.5	54.1	6.6	8.0	5.8
1	B B Bull Brand Fitting Ration	Maritime Milling Co., Inc.	13.0	15.1	14.0	5.1	4.0	51.9	7.0	9.0	7.9
2	Pilgrim Fitting Ration	Ogden Grain Co.	13.1	13.8	12.0	3.5	4.0	58.9	4.9	7.0	5.8
3	Manamar Fitting Ration	Park & Pollard Co.	14.1	13.2	12.0	3.4	3.5	54.8	6.6	7.0	7.9
2	Purina Dry and Fitting Chow	Ralston Purina Co.	13.0	15.4	12.5	3.0	2.5	49.4	10.6	14.0	8.6
1	Purina Heifer Growing Chow	Ralston Purina Co.	13.0	16.2	14.0	3.3	2.5	50.6	9.3	14.0	7.6
4	Hygrade Fitting Ration	St. Albans Grain Co.	13.0	13.8	12.0	4.9	4.5	55.6	5.6	8.0	7.1
4	Wirthmore 14 Fitting Ration	St. Albans Grain Co.	13.3	16.2	14.0	4.6	4.0	53.6	6.2	7.0	6.1
1	United Farmers Fitting Ration	United Cooperative Farmers, Inc.	13.0	14.9	12.0	4.1	3.5	55.8	6.7	7.0	5.5
1	Blue Seal Fitting Ration with Cod Liver Oil	H. K. Webster Co.	12.6	14.1	13.0	4.7	4.5	54.8	8.3	7.0	5.5



Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 II. PREPARED FEEDS — Continued.  
 (b) *Starchy Feeds* — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
Stock Feeds.											
1	Arcady Stock Feed	Arcady Farms Milling Co.	11.0	13.1	10.0	3.7	3.0	53.0	11.5	12.0	7.7
1	Pennant Brand Stock Feed	E. W. Bailey & Co.	11.0	11.2	9.5	5.0	4.0	57.1	9.7	9.5	6.0
2	Coweco's Stock Feed	Nicolas Courcy Grain Co.	12.2	13.5	10.0	4.8	3.0	55.2	8.7	12.0	5.6
2	Coweco Stock Feed	E. A. Cowee Co.	10.7	11.7	9.0	4.2	4.0	55.5	11.3	11.0	6.6
2	Crystal Stock Feed	Curley Brothers	11.8	13.3	12.0	3.8	4.0	53.1	12.0	12.0	6.0
2	Premier Stock Feed	Curley Brothers	10.7	9.5	9.0	4.4	4.5	56.8	12.5	13.5	6.1
1	King Stock Feed	Cutler Co.	11.0	10.1	9.0	5.4	4.0	60.3	8.4	9.5	4.8
1	Delaware Stock Feed	Delaware Mills, Inc.	11.0	10.6	9.0	3.7	3.0	56.9	12.8	12.0	5.0
2	Elmore Stock Feed	Elmore Milling Co., Inc.	11.1	11.5	10.0	5.1	3.0	55.9	12.0	12.0	4.4
1	Eshelman Red Rose Stock Feed	John W. Eshelman & Sons	11.0	12.5	9.0	4.0	3.0	56.1	11.3	11.0	5.1
4	North Star Stock Feed	Farm Service Stores, Inc.	10.9	10.3	9.0	3.9	3.0	57.3	13.3	12.0	4.3
2	Garland's HiCarbo Ration	J. B. Garland & Son	11.5	13.1	7.0	2.6	2.0	51.3	15.4	17.0	6.1
2	White Stock Feed	J. B. Garland & Son	11.8	9.4	8.0	4.2	3.0	58.0	10.4	14.0	6.2
2	Grandin's Stock Food	D. H. Grandin Milling Co.	10.7	10.4	8.5	4.7	4.0	58.6	11.4	12.0	4.2
1	"Phoenix" Stock Feed	Great Eastern Feed Mills	9.1	11.1	10.5	4.5	4.0	55.3	13.8	14.0	6.2
1	"Phoenix" Stock Feed 1	Great Eastern Feed Mills	11.0	11.5	8.0	3.7	3.0	56.4	9.9	12.0	7.5
1	B B Hi-Fest Stock Feed Sweetened	Maritime Milling Co., Inc.	11.0	11.6	9.0	6.1	3.0	59.2	7.8	12.0	4.3
4	Moon's Stock Feed	Geo. Q. Moon & Co., Inc.	11.3	11.2	9.0	5.3	3.0	56.5	10.6	12.0	5.1
6	Park & Pollard Stock Feed	Park & Pollard Co.	11.1	10.4	9.0	4.0	4.0	59.5	8.5	12.0	6.3
1	Quaker Sugared Schumacher Feed	Quaker Oats Co.	11.0	11.2	10.0	3.9	3.0	57.0	10.6	12.0	6.3
10	Wirthmore Stock Feed.	St. Albans Grain Co.	10.9	10.2	9.0	5.3	4.0	58.2	9.1	9.5	6.0
2	Made-Right White Stock Feed	C. P. Washburn Co.	11.0	9.4	9.0	5.7	4.0	62.1	8.8	10.0	3.0
2	Blue Seal Stock Feed	H. K. Webster Co.	10.4	11.5	8.5	4.1	3.5	55.1	13.5	11.0	5.4
2	Williams Stock Feed	Est. M. G. Williams	10.7	12.4	10.0	4.4	4.0	58.6	9.4	12.0	4.5
Molasses Feeds.											
4	Wayne Supreme Horse Feed	Allied Mills, Inc.	14.0	10.6	9.5	3.1	3.0	64.9	5.1	8.0	2.3
2	June Pasture	Allied Mills, Inc.	16.6	13.5	10.0	1.0	0.5	43.4	15.5	21.0	10.0
2	Beets - Oats Horse & Mule Feed	Arcady Farms Milling Co.	14.6	10.7	10.0	2.6	3.0	59.0	7.8	10.0	5.3
1	Wonder Horse and Mule Feed	Arcady Farms Milling Co.	14.0	10.3	9.0	3.6	3.0	62.2	6.6	10.0	3.3
1	Pennant Horse Feed	E. W. Bailey & Co.	14.0	12.1	10.75	3.4	3.5	60.9	5.4	6.5	4.2
1	Fort Orange Brand Horse Feed	Barber & Bennett, Inc.	14.0	11.1	9.0	3.4	3.0	61.6	6.6	10.0	3.3
2	Beacon's Cayuga Horse Feed	Beacon Milling Co., Inc.	14.0	10.5	10.0	3.0	2.5	63.1	6.3	9.0	3.1

## INSPECTION OF COMMERCIAL FEEDSTUFFS

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1935 Registration.

## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## II. PREPARED FEEDS — Concluded.

(b) *Starchy Feeds* — Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	Miscellaneous Feeds.										
2	Arcady-Wonder Concentrate with Mo- lasses	Arcady Farms Milling Co.	10.7	29.3	30.0	5.6	4.0	38.2	6.2	6.0	10.0
2	Ground Oats & Banner Feed	F. Diehl & Son, Inc.	9.1	13.8	6.0	4.5	2.0	51.9	15.9	30.0	4.8
4	Banner Feed	Quaker Oats Co.	7.8	13.9	13.0	5.3	4.5	49.4	17.7	19.0	5.9
1	Barley Flour	Quaker Oats Co.	8.7	15.3	13.0	1.5	2.0	72.7	0.5	2.0	1.3
2	Made-Right Mixed Feed	C. P. Washburn Co.	12.9	17.5	15.0	4.5	4.0	54.0	7.0	8.0	4.1

## III. POULTRY FEEDS.

1	Alfalfa Stem Meal	A. B. Caple Co.	11.7	13.0	9.0	1.2	0.8	31.5	36.7	40.0	5.9
1	Alfalfa Meal	A. B. Caple Co.	10.0	14.7	13.0	1.4	1.0	31.7	34.8	33.0	7.4
1	Alfalfa Meal	Allied Mills, Inc.	10.0	15.4	13.5	1.9	1.5	38.8	25.0	33.0	8.9
3	Alfalfa Meal	A. B. Caple Co.	12.0	14.8	13.0	1.4	1.0	34.9	31.0	33.0	5.9
2	Alfalfa Stem Meal	A. B. Caple Co.	10.0	13.0	9.0	1.8	0.8	37.0	31.6	40.0	6.6
2	Fernando Ideal Greens Alfalfa Leaf Meal	Fernando Valley Milling & Supply Co.	9.9	19.8	20.0	2.4	2.5	38.1	19.5	18.0	10.3
2	*Grandin's Poultry Green Food	D. H. Grandin Milling Co.	14.2	12.3	10.0	1.4	1.0	44.8	20.4	25.0	6.9
2	Green Acres Brand Super-Quality Alfalfa Meal	Green Acre Farms	10.0	18.4	17.0	2.8	2.0	35.2	23.0	25.0	10.6
2	California Alfalfa Leaf Meal	National Mineral Products Co., Ltd.	10.0	19.3	20.0	2.2	1.5	39.4	21.0	18.0	8.1
4	Peevee Alfalfa Leaf Meal	Pecos Valley Alfalfa Mill Co.	8.6	20.9	20.0	2.5	2.5	37.1	20.2	18.0	10.7
	<b>Alfalfa Leaf Meal.</b>										
1	Fernando Ideal Greens Alfalfa Leaf Meal	Fernando Valley Milling & Supply Co.	9.6	20.6	20.0	2.6	2.5	40.1	17.9	18.0	9.2
1	California Alfalfa Leaf Meal	National Mineral Products Co., Ltd.	10.0	19.8	20.0	2.5	1.5	39.8	17.7	18.0	10.2
3	Peevee Alfalfa Leaf Meal	Pecos Valley Alfalfa Mill Co.	9.6	21.7	20.0	2.6	2.5	39.7	16.6	18.0	9.8

Feeding Oat Meal.		J. A. Forrest Co.	Hood Mills Co.	Quaker Oats Co.	10.0	16.9	15.0	6.6	5.0	60.7	3.6	3.9	2.2
3	Bronco Fine Ground Feeding Oatmeal	.	.	.	10.5	16.3	14.0	5.0	5.0	63.9	2.2	4.0	2.1
1	Fine Ground Feeding Oat meal	.	.	.	10.0	16.4	16.0	6.1	6.0	63.7	1.8	3.5	2.0
2	North Star Oatmeal	.	.	.									
Chick Starting and Growing Feeds.		Allied Mills, Inc.	Allied Mills, Inc.	Allied Mills, Inc.	12.0	17.7	16.0	4.9	3.0	52.2	5.7	7.0	7.5
1	Empire Growing Mash	.	.	.	12.1	16.4	16.0	5.4	3.5	56.5	4.3	6.0	5.3
2	Empire Starter & Grower with Sardine Oil	.	.	.	12.2	16.6	17.0	5.9	4.0	52.1	5.0	6.0	6.2
2	Wayne Chick Starter with Sardine Oil	.	.	.	12.2	17.1	16.0	5.4	4.0	53.5	4.6	6.0	7.2
4	Wayne Growing Mash with Sardine Oil	.	.	.	11.5	16.3	16.0	5.2	4.0	55.2	4.4	5.0	7.4
2	Ames Complete Growing & Egg Ration	.	.	.	12.0	18.0	17.0	5.3	5.0	49.7	6.5	6.0	8.5
1	Ames Growing Mash with Cod Liver Oil	.	.	.	12.0	18.0	17.0	4.7	4.0	50.8	6.3	5.5	8.2
1	Ames Complete Starter and Broiler Ration	.	.	.	12.0	18.0	17.0	4.7	4.0	50.8	6.3	5.5	8.2
1	Ames Complete Starter and Broiler Ration	.	.	.	11.3	18.1	17.5	4.3	4.0	52.7	6.0	7.0	7.6
2	Arcady-Wonder Complete All-Mash Chick Starter	.	.	.									
1	Arcady-Wonder Growing Mash	.	.	.	12.2	17.9	17.0	4.1	5.0	50.9	6.5	5.0	8.4
1	Sunkist Growing Mash	.	.	.	12.0	16.9	17.0	3.7	4.0	48.8	7.8	7.0	10.8
1	Arcady Farms Milling Co.	.	.	.	12.0	18.6	16.0	3.9	4.0	48.1	9.2	8.0	8.2
2	Beacon's Cayuga Growing Mash	.	.	.	12.0	17.7	15.0	5.2	4.0	51.3	6.4	7.0	7.4
2	Beacon Complete Starting Ration	.	.	.	12.4	18.1	17.5	4.5	4.0	53.2	4.8	6.0	7.0
1	Beacon Milling Co., Inc.	.	.	.									
1	Borden's Chick Starting Feed	.	.	.	12.0	19.0	17.0	4.8	4.0	51.2	4.4	6.0	8.6
1	Borden Grain Co.	.	.	.									
1	Community Feed Stores, Inc.	.	.	.	12.0	17.9	17.0	4.6	4.5	51.4	6.7	8.0	7.4
1	Community Growing Mash	.	.	.	12.0	18.1	17.0	4.5	4.0	50.9	5.6	5.0	8.9
1	Courcy's Growing Feed	.	.	.	12.0	18.1	17.0	4.4	5.0	52.9	4.3	5.0	7.8
1	Eastern Starting Feed	.	.	.									
1	Coweco Sunrise Complete Starting & Broiler Ration	.	.	.	13.6	16.8	16.0	4.1	4.0	49.2	7.3	6.0	9.0
2	Coweco Growing Mash	.	.	.	12.2	17.9	14.0	4.6	4.5	47.9	7.2	6.0	10.2
3	Coweco Starting Mash	.	.	.	12.4	16.8	17.0	4.8	4.5	49.2	7.7	6.0	9.1
3	Coweco Sunrise Growing Mash	.	.	.	12.0	18.0	16.0	6.1	4.0	45.8	6.4	7.0	11.7
3	Utility Growing Ration	.	.	.	12.9	16.0	15.0	4.6	4.0	53.3	6.4	7.0	6.8
1	Utility Starting Ration	.	.	.	13.0	17.7	17.5	4.6	4.0	52.4	5.1	6.5	7.2
1	Crystal All Grain Starting Food	.	.	.	12.0	16.3	15.0	4.7	5.0	56.9	3.6	4.0	6.5
1	Crystal Growing Mash	.	.	.	12.0	17.5	16.0	5.2	5.0	53.2	4.5	5.0	7.3
1	Premier Growing Mash	.	.	.	12.0	21.1	18.5	5.8	4.0	45.6	6.3	6.5	9.2
1	King Complete Chick Starter and Broiler Ration	.	.	.									
1	King Complete Growing Ration	.	.	.	12.0	19.1	17.5	4.8	4.0	52.2	5.0	5.5	6.9
1	King Growing Feed with Fortified Cod Liver Oil	.	.	.	12.0	15.3	14.0	4.8	3.75	57.5	4.3	6.0	6.1
1	Delaware All Mash Chick Starter	.	.	.	12.0	17.5	15.0	5.2	4.5	52.7	5.9	6.0	6.7
1	Indian Growing Mash	.	.	.	13.0	18.4	17.0	5.1	5.0	50.6	5.4	6.0	7.2
1	Diauto's Fancy Chick Growing Mash	.	.	.	12.0	17.8	15.0	6.0	4.5	50.9	6.2	7.0	7.1
2	Diauto's Chick Growing Mash	.	.	.	11.7	18.5	16.0	5.7	4.0	50.6	5.6	5.0	7.9
1	Frederick Growing Mash	.	.	.	12.0	19.0	16.0	4.7	4.0	52.6	4.9	8.0	6.8
2	Gambrill's Chick Starter	.	.	.	11.7	18.1	16.0	5.3	4.0	52.6	4.4	4.5	7.9
	Gambrill & Gambrill, Inc.	.	.	.									

\*Alfalfa, beet pulp and molasses.  
11935 Registration.

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
Chick Starting and Growing Feeds — Continued											
1	Gambrill's Growing Mash . . . . .	Dietrich & Gambrill, Inc. . . . .	10.9	23.2	18.0	5.2	4.0	42.6	5.5	7.0	12.6
1	Special Growing Feed . . . . .	East Bridgewater Farmers' Exchange . . . . .	12.3	18.4	15.0	5.2	4.0	53.0	5.2	7.0	5.9
4	Eastern States All-Mash Developer . . . . .	Eastern States Farmers' Exchange . . . . .	11.7	15.5	14.5	5.0	3.5	56.8	5.0	7.0	6.0
4	Eastern States Developer . . . . .	Eastern States Farmers' Exchange . . . . .	12.1	19.0	18.5	5.0	4.0	50.7	5.5	6.5	7.7
3	Eastern States Starting and Broiler Ration . . . . .	Eastern States Farmers' Exchange . . . . .	11.6	19.6	18.5	5.5	4.0	51.8	4.5	5.0	7.0
2	Elmore Chixsaver . . . . .	Elmore Milling Co., Inc. . . . .	12.6	18.0	16.5	5.3	4.0	51.2	5.6	8.0	7.3
2	Eshelman Red Rose All-Mash Starter . . . . .	John W. Eshelman & Sons . . . . .	12.0	18.3	16.0	4.9	4.0	52.9	4.3	6.5	7.6
1	Eshelman Red Rose Growing Mash . . . . .	John W. Eshelman & Sons . . . . .	12.0	20.0	16.0	5.4	4.0	49.2	6.3	7.0	6.9
1	C Growing Mash . . . . .	Farm Service Stores, Inc. . . . .	11.6	17.1	18.0	5.2	4.0	50.7	6.9	7.0	8.5
3	North Star Chick Starter . . . . .	Farm Service Stores, Inc. . . . .	12.0	18.7	18.0	5.5	4.0	49.3	5.7	5.0	8.8
2	North Star Growing Mash . . . . .	Farm Service Stores, Inc. . . . .	12.0	20.3	16.0	5.2	4.0	47.3	5.4	7.0	9.8
2	Flory's Growing Mash . . . . .	Flory Milling Co., Inc. . . . .	11.6	18.4	17.0	5.5	4.0	51.4	6.0	7.0	7.1
2	Fountain's Buttermilk Growing Feed . . . . .	Fred A. Fountain . . . . .	12.0	20.4	16.0	5.9	4.5	48.2	5.0	7.0	8.5
2	Fountain's Buttermilk Starting Feed . . . . .	Fred A. Fountain . . . . .	12.4	20.2	17.0	5.1	4.0	51.1	4.2	6.0	7.0
2	Garland's Economy Growing Mash . . . . .	J. B. Garland & Son . . . . .	11.9	17.8	16.0	5.7	4.5	48.8	5.7	8.0	10.1
2	Garland's Growing Mash . . . . .	J. B. Garland & Son . . . . .	12.0	17.0	14.0	5.8	4.0	48.1	6.1	8.0	11.0
1	Eventually Gold Medal Chick Ration . . . . .	General Mills, Inc. . . . .	11.8	17.8	15.5	3.8	4.0	53.8	5.0	6.0	7.8
1	Eventually Gold Medal Growing Mash . . . . .	General Mills, Inc. . . . .	12.0	17.9	16.0	4.8	4.0	51.9	5.2	7.5	8.2
1	Starting & Growing Mash (New England Conference Formula) . . . . .	Goode Grain Co. . . . .	12.0	15.7	16.0	4.9	4.0	50.7	7.2	7.0	9.5
1	Grandin's Baby Chick Starter . . . . .	D. H. Grandin Milling Co. . . . .	12.0	16.7	14.0	5.3	4.0	55.6	4.3	5.0	6.1
1	Grandin's Combined Chick and Broiler Ration . . . . .	D. H. Grandin Milling Co. . . . .	11.7	18.3	15.0	5.3	4.0	50.9	5.3	6.0	8.5
1	Grandin's Complete Starting Ration . . . . .	D. H. Grandin Milling Co. . . . .	11.7	17.0	16.0	4.9	4.0	54.3	4.3	6.0	7.8
3	Grandin's Growing Mash . . . . .	D. H. Grandin Milling Co. . . . .	11.9	17.0	15.0	5.7	4.0	49.8	5.8	8.0	9.8
1	Daily Growth Chick Starter . . . . .	Great Atlantic & Pacific Tea Co. . . . .	13.2	18.0	16.0	4.5	4.0	51.7	5.3	5.0	7.3
1	Daily Growth Growing Mash . . . . .	Great Atlantic & Pacific Tea Co. . . . .	12.4	19.1	17.5	4.7	4.0	50.1	6.4	7.0	7.3
2	Phoenix 16% Growing Mash . . . . .	Great Eastern Feed Mills . . . . .	11.4	17.6	16.0	4.4	4.0	51.8	5.5	8.0	9.1
2	Welcome Growing Mash . . . . .	D. Harbeck . . . . .	11.9	17.9	16.0	5.1	4.0	51.4	5.1	7.0	8.6
2	Welcome Starter & Broiler Ration . . . . .	D. Harbeck . . . . .	12.2	19.1	18.0	5.4	4.0	52.2	4.2	7.0	6.9
2	Growing Mash . . . . .	Jaquith & Co. . . . .	11.7	16.9	16.0	5.3	5.0	53.2	5.7	6.0	7.2
1	Starting Feed . . . . .	Jaquith & Co. . . . .	10.7	19.2	14.0	5.3	5.0	49.8	5.1	4.0	9.9
1	Just Right Chick Starter . . . . .	Jersee Co. . . . .	12.1	17.3	16.0	4.6	5.0	54.5	5.5	6.0	6.0
1	Just Right Growing Mash . . . . .	Jersee Co. . . . .	12.0	16.9	17.0	4.2	5.0	53.5	6.0	7.4	7.4
1	Apex Complete Grower . . . . .	Kasco Mills, Inc. . . . .	12.1	15.6	14.0	4.8	4.0	55.3	5.6	8.5	6.6

[illegible]



Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Laying Mash</b> — Continued										
1	Ames Egg Mash with Cod Liver Oil	A. P. Ames Co.	11.5	20.0	20.0	5.7	5.0	46.1	6.3	5.0	10.4
1	Ames Egg Mash	A. P. Ames Co.	11.0	19.9	20.0	5.1	4.5	48.8	5.3	7.0	9.9
1	Acrcady-Wonder Complete Laying Ration	Acrcady Farms Milling Co.	11.9	16.7	16.0	4.1	4.5	50.6	7.7	7.0	9.0
4	Acrcady-Wonder Laying Mash	Acrcady Farms Milling Co.	11.6	19.7	20.0	4.4	4.0	46.9	6.2	7.0	11.2
2	Sunkist Egg Mash	Acrcady Farms Milling Co.	11.9	20.0	20.0	4.2	4.0	46.4	7.5	8.0	10.0
2	Weaco Dry Mash	W. E. Atkinson Co.	11.8	18.8	18.0	4.4	4.0	51.4	5.5	7.0	8.1
2	Green Mountain Laying Mash	Berkshire Coal & Grain Co., Inc.	11.4	19.9	19.0	6.0	4.0	45.8	7.0	8.0	9.9
2	Borden's Laying Mash	Borden Grain Co.	10.9	19.5	19.0	5.4	4.5	47.3	5.8	7.0	11.1
2	Brown's Egg Mash	Geo. B. Brown	11.4	18.1	18.0	4.9	5.0	48.3	7.5	10.0	9.8
2	Community Laying Mash	Community Feed Stores, Inc.	10.8	21.0	20.0	5.4	4.0	45.9	7.3	7.0	9.6
2	Courcy's Eastern Milk Laying Mash	Nicolas Courcy Grain Co.	11.1	18.4	17.0	4.6	4.0	51.8	5.8	6.0	8.3
2	The Perfect Dry Mash	Cover & Palm Co.	10.7	18.3	15.0	5.6	4.0	48.5	7.3	10.0	9.6
1	Coweco All Mash Ration	E. A. Cowee Co.	11.9	19.1	15.0	4.4	4.0	47.9	5.7	5.0	11.0
3	Coweco Laying Mash	E. A. Cowee Co.	11.5	22.1	20.0	4.7	4.0	44.0	5.8	7.5	11.9
2	Coweco Sunrise Laying Mash	E. A. Cowee Co.	11.3	19.7	16.0	5.7	3.5	44.1	7.0	8.0	12.2
2	Utility Laying Ration	Chas. M. Cox Co.	11.7	20.5	18.0	4.8	4.0	46.2	6.8	7.0	10.0
2	Crystal Egg Mash	Curley Brothers	11.1	20.1	18.0	5.1	4.0	47.2	5.5	6.0	11.0
1	Delaware Laying Mash	Delaware Mills, Inc.	12.8	19.6	20.0	5.8	5.0	46.9	6.1	7.0	8.8
2	Indian Laying Mash	Delaware Mills, Inc.	11.9	19.3	18.0	5.2	5.0	48.2	5.7	7.0	9.7
2	Indian Laying Mash	Delaware Mills, Inc.	13.2	18.3	18.0	5.1	4.5	48.9	6.6	8.0	7.9
2	Diauto's Special Egg Mash	Frank Diauto	11.0	19.8	20.0	5.8	4.0	48.6	6.1	7.0	8.7
2	Diehl's Dry Mash	F. Diehl & Son, Inc.	11.6	24.5	16.0	4.7	3.0	45.3	6.2	12.0	7.7
2	All Purpose Complete Ration	Dietrich & Gambrell, Inc.	11.6	17.3	15.0	6.5	4.5	52.6	5.1	6.0	6.9
2	D. & G. Poultry Conditioning Ration	Dietrich & Gambrell, Inc.	11.3	17.3	15.0	8.8	6.0	48.6	4.2	6.0	9.8
3	Frederick Laying Mash	Dietrich & Gambrell, Inc.	11.6	19.0	18.0	4.9	4.0	51.2	5.4	8.0	7.9
3	Excel Mash	J. L. Dunnell & Son	11.5	23.0	19.0	4.6	5.0	46.6	4.9	6.0	9.4
1	Special Mash Feed	East Bridgewater Farmers' Exchange	13.6	18.8	18.0	4.8	4.0	52.0	4.3	6.0	6.5
4	Eastern States Combination Mash	Eastern States Farmers' Exchange	12.4	15.8	15.0	5.7	4.0	53.5	5.7	6.5	6.9
3	Eastern States Combination Mash (Pelleted)	Eastern States Farmers' Exchange	11.8	16.0	15.0	5.6	4.0	54.8	5.2	6.5	6.6
1	Eastern States Controller Mash	Eastern States Farmers' Exchange	9.9	20.2	18.5	3.8	2.5	57.4	2.9	4.0	5.8
1	Eastern States Egg Mash	Eastern States Farmers' Exchange	11.2	18.4	17.0	6.1	4.0	49.4	5.5	6.0	9.1
4	Eastern States Producer 20	Eastern States Farmers' Exchange	11.2	20.9	20.0	6.4	4.0	46.7	5.5	6.0	9.3
3	Eastern States Producer 20 (Pelleted)	Eastern States Farmers' Exchange	11.2	21.1	20.0	6.8	4.0	46.7	4.9	6.0	9.3
4	Eastern States Producer Mash	Eastern States Farmers' Exchange	11.6	18.5	17.0	6.2	4.0	49.6	5.2	6.5	8.9

Eastern States Producer Mash (Pelleted)	Eastern States Farmers' Exchange	11.6	18.1	17.0	6.4	4.0	50.3	5.1	6.5
Countryside Egg Mash	Economy Grocery Stores Corp.	11.3	19.2	18.0	5.8	3.0	44.8	5.7	8.0
The Ellis Poultry Mash	Michael W. Ellis	11.3	21.7	20.0	5.4	4.0	48.3	6.2	8.0
Elmore Complete Laying Ration	Elmore Milling Co., Inc.	11.5	17.5	16.0	5.0	4.0	53.5	5.5	6.0
Elmore Egg Mash	Elmore Milling Co., Inc.	13.1	20.3	20.0	5.8	4.0	48.0	5.5	6.0
Elmore Eggmaker	Elmore Milling Co., Inc.	11.5	19.4	17.0	6.2	4.5	50.3	5.1	8.0
Elmore M.A.C. Laying Mash	Elmore Milling Co., Inc.	12.7	18.7	17.0	5.0	5.0	50.0	5.9	7.7
Eshelman Penny Laying Mash	John W. Eshelman & Sons	11.5	20.2	18.0	5.9	5.0	47.0	6.9	8.0
C Laying Mash	Farm Service Stores, Inc.	11.3	21.3	20.0	5.6	5.0	47.0	5.7	8.0
North Star Laying Mash	Farm Service Stores, Inc.	11.3	19.8	19.0	5.1	4.5	47.6	7.0	8.9
Service Egg Mash Complete	Farm Service Stores, Inc.	11.0	22.2	20.0	5.8	5.0	43.5	5.9	7.0
Henfield Egg Mash	Farm Service Stores, Inc.	11.5	18.9	16.0	4.9	4.0	52.0	4.7	5.5
Henry's Blue Seal "All-Mash" Laying Ration	First National Stores, Inc.	12.0	21.7	20.0	6.3	5.0	44.9	6.5	7.0
Flory's 32% Protein Supplement Mash	Flory Milling Co., Inc.	11.6	15.9	15.0	5.8	4.5	52.1	6.4	7.0
Golden Egg Laying Mash	Flory Milling Co., Inc.	11.5	29.4	32.0	7.3	5.0	28.9	6.7	8.0
Sunray Laying Mash	Flory Milling Co., Inc.	11.0	19.9	20.0	5.2	4.0	47.6	7.4	8.9
Fountain's Buttermilk Laying Mash	Fred A. Fountain	11.2	18.8	18.0	5.1	4.0	47.5	8.3	10.0
Special Mash or Poultry Feed	Dean S. French	12.0	20.7	17.0	4.8	4.5	48.7	8.7	7.0
Eggmaker	Paul Fuller & Sons	11.5	20.1	20.0	6.5	4.0	47.0	5.8	9.1
Garland's Economy Egg Mash	J. B. Garland & Son	11.5	18.3	18.0	5.5	4.0	49.7	6.3	8.0
Garland's Laying Mash	J. B. Garland & Son	11.3	19.3	16.0	5.2	4.0	46.2	7.0	8.7
Eventually Gold Medal Egg Mash	General Mills, Inc.	11.3	21.1	20.0	4.6	4.0	45.9	4.9	8.0
Conference Mash	W. K. Gilmore & Sons, Inc.	11.5	20.9	19.0	5.0	5.0	46.1	5.9	8.0
Neponset Poultry Mash	W. K. Gilmore & Sons, Inc.	11.6	15.8	17.0	4.5	4.0	49.6	6.2	6.5
Goode Laying Mash	Goode Grain Co.	11.5	20.3	20.0	4.9	3.0	45.3	5.9	10.0
Grandin's Complete Laying Ration	D. H. Grandin Milling Co.	11.9	17.7	17.0	5.4	4.0	48.8	5.9	7.0
Grandin's Laying Mash	D. H. Grandin Milling Co.	11.4	17.9	15.0	6.1	4.0	52.5	5.3	7.0
Grandin's Start-To-Finish Mash	D. H. Grandin Milling Co.	11.2	21.3	20.0	5.3	4.0	45.4	6.3	8.0
Daily Egg Laying Mash	Great Atlantic & Pacific Tea Co.	11.6	17.8	16.0	5.2	4.0	51.3	6.2	7.0
Daily Egg Mash Feed	Great Atlantic & Pacific Tea Co.	12.9	19.6	20.0	4.5	4.0	49.8	6.1	7.5
"Phoenix" All Purpose Complete Ration	Great Eastern Feed Mills	11.4	20.6	20.0	5.6	4.5	45.9	6.0	7.0
"Phoenix" 20% Laying Mash	Great Eastern Feed Mills	11.5	17.5	16.0	5.2	4.5	55.1	4.4	6.0
"Wamsit" 18% Laying Mash	Great Eastern Feed Mills	10.2	20.9	20.0	4.4	4.0	47.4	6.7	7.0
Welcome Laying Mash	D. Harbeck	10.3	21.1	18.0	4.5	3.5	46.8	7.9	7.0
Hodgkins' Poultry Mash	D. B. Hodgkins' Sons	11.8	18.3	17.0	5.1	4.0	50.6	5.4	7.0
Make-M-Lay Laying Mash	R. B. Howlett	11.5	19.9	18.0	5.7	5.0	46.4	7.3	8.0
Ideal Poultry Mash	Horvitz Grain Co.	11.8	20.6	20.0	5.9	5.0	46.5	6.5	9.0
Laying Mash	R. B. Howlett	11.5	18.6	15.0	5.3	4.0	50.7	6.5	10.0
Just Right Egg Mash	Jersee Co.	11.4	19.8	17.0	5.7	4.0	49.0	5.8	8.0
Apex Laying Mash	Kasco Mills, Inc.	11.8	19.4	18.0	4.8	5.0	48.4	6.5	8.0
Kasco All-Mash Laying Food	Kasco Mills, Inc.	12.9	20.2	20.0	5.2	4.0	46.7	6.3	8.5
"K" Laying Mash	Kasco Mills, Inc.	13.9	16.1	15.0	4.5	4.0	53.7	5.6	6.0
Kasco Poultry Flushing Mash	Kasco Mills, Inc.	11.9	18.8	17.0	5.1	4.0	50.0	5.6	8.0
Larro Egg Mash <sup>1</sup>	Larroe Milling Co.	11.5	19.8	17.0	4.6	4.0	48.4	4.6	5.5
		11.5	20.9	19.0	5.0	4.0	47.7	6.3	7.5
									8.5
									8.5
									11.1
									7.3
									8.0
									6.3
									8.5
									8.7
									6.2
									11.1
									8.6
									5.5
									7.5



Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
 III. POULTRY FEEDS — Continued.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	Laying Mash										
1	Larroe Egg Mash	Larroe Milling Co.	11.2	21.6	20.0	5.1	4.0	46.4	6.9	7.5	8.8
2	"Mansfield" Dry Poultry Mash	Mansfield Milling Co.	12.2	23.3	22.0	6.0	5.0	43.6	6.7	7.0	8.2
1	B B Bull Brand All Mash Laying Ration	Maritime Milling Co., Inc.	11.5	17.8	15.0	4.5	4.0	51.8	7.0	7.0	7.4
1	B B Bull Brand Laying Mash	Maritime Milling Co., Inc.	11.5	21.9	20.0	4.5	4.5	46.1	7.2	7.0	8.8
3	Dollar Maker Egg Mash	Maritime Milling Co., Inc.	11.7	18.5	17.0	4.8	3.5	49.6	7.2	9.0	8.2
1	Moon's Complete Laying Mash	Geo. Q. Moon & Co., Inc.	11.5	17.9	17.0	6.4	4.0	48.2	5.3	7.0	10.7
1	Moon's Laying Mash	Geo. Q. Moon & Co., Inc.	12.3	20.0	20.0	4.7	4.0	46.6	5.7	4.0	10.7
2	Moon's Special A Laying Mash	Geo. Q. Moon & Co., Inc.	11.5	18.6	18.0	5.6	5.0	46.3	6.3	9.0	11.7
1	Good Value Feeds Laying Mash	Ogden Grain Co.	11.5	18.8	18.5	5.6	4.5	50.8	5.1	7.0	8.2
1	Pilgrim Laying Mash	Ogden Grain Co.	15.4	20.4	20.0	4.6	5.0	45.3	5.7	7.0	8.6
4	Pilgrim Special Laying Mash	Ogden Grain Co.	12.2	19.5	18.0	4.9	4.0	51.1	5.2	7.0	7.1
1	Good Value Feeds Thrift Complete Laying Mash	Ogden Grain Co.									
	Bidwell Dry-Mash		11.5	20.1	18.0	5.5	4.0	50.6	3.9	8.0	8.4
1	Lay or Bust Dry-Mash	Park & Pollard Co.	11.9	21.6	18.0	3.8	3.0	48.0	7.1	8.0	7.6
3	Manamar Lay or Bust Mash	Park & Pollard Co.	11.4	19.7	18.0	4.4	3.0	48.4	6.2	7.0	9.9
1	Manamar Complete Life Cycle Mash	Park & Pollard Co.	11.5	19.0	18.0	4.8	3.5	46.7	8.3	6.0	9.7
8	Parker's Egg Mash	Park & Pollard Co.	11.8	17.5	16.0	4.2	3.5	52.0	6.5	6.0	8.0
2	O Boy Egg Mash	George H. Parker Grain Co.	11.3	19.0	18.0	5.7	5.0	46.9	6.7	7.0	10.4
1	Egg-Em-On Laying Mash	Phanef & Son	12.5	16.7	17.0	4.8	4.5	53.1	6.7	7.5	6.2
1	Big Egg Laying Mash	H. C. Puffer Co.	11.5	21.6	20.0	5.4	4.0	47.0	6.4	9.0	8.1
2	Quaker Ful-O-Pep Egg Mash	Quaker Oats Co.	10.9	19.1	18.0	5.3	4.0	50.7	7.4	8.0	6.6
1	Purina Egg Chowder	Quaker Oats Co.	11.6	20.3	20.0	6.0	4.5	47.4	6.4	8.0	8.4
2	Purina Lay Chow	Ralston Purina Co.	11.5	20.8	19.0	5.5	3.5	45.3	7.0	8.0	9.8
5	Purina Layene (Complete Ration)	Ralston Purina Co.	11.4	20.0	19.0	5.4	3.5	47.2	6.3	8.0	9.7
7	Riley's Laying Mash	Ralston Purina Co.	11.5	16.9	15.5	5.5	3.5	53.5	4.7	8.0	7.9
1	Minot Complete Laying Mash	D. F. Riley	11.5	22.0	20.0	4.9	4.5	47.7	4.8	6.0	9.1
2	Minot Milk Egg Mash	Ryther & Warren	12.1	16.2	15.0	4.4	3.5	55.0	5.0	6.0	7.3
2	Minot Poultry Mash	Ryther & Warren	11.5	18.5	17.0	5.4	4.5	50.6	5.3	7.0	8.7
2	Wirthmore Complete Laying Ration	Ryther & Warren	11.7	19.4	18.0	4.7	5.0	48.7	5.6	8.0	9.9
1	Wirthmore Laying Mash with Cod Liver Oil	St. Albans Grain Co.	11.5	16.2	15.0	4.6	4.0	55.8	4.9	5.0	7.0
2	Paramount Laying Mash	St. Albans Grain Co.									
1	Pentucket Laying Mash	Smith, Bodfish, Swift Co.	11.5	19.3	20.0	5.2	4.0	49.0	5.5	7.0	9.5
1		Mrs. Annie P. Smith	11.5	18.6	20.0	5.4	3.5	48.5	6.2	8.0	9.8
1			11.5	17.4	16.2	4.5	3.5	49.9	7.6	7.0	9.1

## INSPECTION OF COMMERCIAL FEEDSTUFFS

[illegible]

Complete Average Analyses of Feeds Collected (Per Cent) — Continued.  
III. POULTRY FEEDS — Concluded.

Num- ber of Sam- ples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Water.	Protein.		Fat.		Nitro- gen Free Ex- tract.	Fiber.		Ash.
				Found.	Guar- anteed.	Found.	Guar- anteed.		Found.	Guar- anteed.	
	<b>Turkey Feeds</b>										
3	Wayne Turkey Mash with Sardine Oil	Allyed Mills, Inc.	11.3	18.3	15.0	5.8	3.5	51.3	6.0	8.0	7.3
2	Wayne Turkey Starting Mash	Allyed Mills, Inc.	11.0	26.4	25.0	6.1	4.0	40.2	6.4	8.0	9.9
3	D. & G. Turkey Growing Mash	Dietrich & Gambrell, Inc.	11.2	21.1	20.0	6.1	4.0	46.6	6.4	8.0	8.6
1	Eastern States Turkey Breeder Mash	Eastern States Farmers' Exchange	10.4	24.1	24.0	4.5	3.5	43.6	5.4	6.0	10.4
2	Eastern States Turkey-Fat	Eastern States Farmers' Exchange	11.0	18.1	16.0	5.8	4.0	53.8	4.8	5.5	7.8
2	Eastern States Turkey-Grow	Eastern States Farmers' Exchange	11.0	21.1	20.0	5.9	4.5	50.0	4.1	5.0	8.0
1	Eastern States Turkey-Start	Eastern States Farmers' Exchange	11.0	27.0	24.0	5.9	4.5	43.1	4.0	5.0	9.0
1	Larroe Turkey Adult Mash	Larroe Milling Co.	11.0	21.5	19.0	4.6	4.0	48.5	6.1	7.5	8.3
1	Quaker Ful-O-Pep Turkey Starter	Quaker Oats Co.	11.0	25.7	25.0	5.8	5.0	42.2	5.7	7.0	9.6
3	Purina Turkey Growing & Fattening Chow	Ralston Purina Co.	11.0	23.3	21.0	5.1	3.5	48.1	5.1	8.0	7.4
2	Wirthmore Turkey Fattening Ration	St. Albans Grain Co.	11.0	16.0	16.0	4.8	4.5	57.4	4.6	7.0	6.2
	<b>Rabbit Feeds</b>										
2	Wayne Rabbit Feed	Allyed Mills, Inc.	10.9	16.0	13.0	4.0	3.0	53.5	9.2	11.0	6.4
1	Coweco Rabbit Mash	E. A. Cowee Co.	11.0	19.0	15.0	5.8	3.5	50.3	6.9	10.0	7.0
1	Kasco Complete Rabbit Ration	Kasco Mills, Inc.	12.8	14.6	12.0	2.6	2.0	46.1	10.3	20.0	13.6
1	Pratts Complete Rabbit Pellets	Pratt Food Co.	11.1	15.5	14.0	3.1	2.0	44.2	18.5	20.0	7.6

## Complete Average Analyses of Feeds Collected (Per Cent) — Continued.

## IV. ANIMAL PRODUCTS.

Number of Samples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Protein.		Fat.		Phos- phoric Acid.	Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.		
	<b>Meat</b>							
1	Corenco 60% Meat Scrap	Consolidated Rendering Co.	63.6	60.0	9.4	6.0	6.1	18.2
1	Corenco 55% Meat Scrap	Consolidated Rendering Co.	55.1	55.0	12.0	6.0	8.6	24.1
1	Morse's 55% Meat Scraps for Poultry	Jas. F. Morse & Co.	55.7	55.0	9.5	8.0	9.7	25.9
1	Morse's 50% Meat Scraps for Poultry	Jas. F. Morse & Co.	51.3	50.0	10.0	8.0	9.4	29.1
1	Steamed Meat & Bone	N. Roy & Son	59.9	50.0	9.5	8.0	8.0	20.5
	<b>Meat and Bone</b>							
1	Corenco 50% Meat & Bone Scrap	Consolidated Rendering Co.	53.0	50.0	9.1	6.0	10.7	29.6
2	Corenco 45% Meat & Bone Scrap	Consolidated Rendering Co.	44.7	45.0	9.4	6.0	12.8	35.4
1	Meat and Bone Scraps	W. D. Higgins Co.	45.3	45.0	11.0	8.0	13.7	36.0
4	Morse's 50% Meat Scraps for Poultry	Jas. F. Morse & Co.	50.8	50.0	9.8	8.0	11.5	30.2
4	Morse's 45% Meat Scraps for Poultry	Jas. F. Morse & Co.	45.0	45.0	9.9	8.0	14.2	35.8
1	Brighton Special Meat Scraps — Quality Brand	New England Rendering Co.	50.0	50.0	9.3	8.0	11.3	29.5
1	55% Register Brand Meat Scraps	John Reardon & Sons Co.	55.0	55.0	9.5	6.0	10.2	27.5
2	50% Register Brand Meat & Bone Scraps	John Reardon & Sons Co.	48.1	50.0	9.7	6.0	13.0	33.8
2	45% Register Brand Meat & Bone Scraps.	John Reardon & Sons Co.	50.0	45.0	10.4	6.0	12.3	32.3
2	Rubco Meat Bone Scrap	H. M. Rubin Co., Inc.	46.7	50.0	8.8	5.0	12.8	34.1
	<b>Bone Meal</b>							
2	Digesta-Bone	Pacific Bone Coal & Fertilizing Co.	5.5	5.0	0.3	none	35.2	87.2
4	Rearco Bone Meal for Feed	John Reardon & Sons Co.	26.0	20.0	1.5	3.0	25.6	62.9
	<b>Fish</b>							
1	Gro-All Crab Meal	Central Chemical Co., Inc.	23.8	31.0	1.8	1.0	2.8	39.4
2	Corenco Cod and Haddock Meal	Consolidated Rendering Co.	65.1	62.0	5.0	2.0	9.2	22.3
1	Gorton's Codfish Meal	Gorton-Pew Fisheries Co., Ltd.	66.7	55.0	2.1	0.1	10.0	24.2

Complete Average Analyses of Feeds Collected (Per Cent) — Concluded.  
IV. ANIMAL PRODUCTS — Concluded.

Number of Samples.	FEEDSTUFFS.	NAME OF MANUFACTURER.	Protein.		Fat.		Phos- phoric Acid.	Ash.
			Found.	Guar- anteed.	Found.	Guar- anteed.		
2	Fish — Concluded "Phoenix" Pure Fish Meal . . . Maine Vitamin D Fish Meal . . . Fish Meal for Poultry . . . Boston Pure Cod & Haddock Meal . . . Register Brand Cod & Haddock Fish Meal . . . Lighthouse Brand Fish Meal . . . Wilpaco Pure Cod and Haddock Fish Meal . . .	Great Eastern Feed Mills . . .	54.7	55.0	8.3	4.0	9.7	26.5
1		Maine Fish Meal Co. . .	55.6	55.0	9.6	15.0	6.6	21.5
1		Jas. F. Morse & Co. . .	64.5	55.0	7.7	3.0	9.4	23.1
1		New England Rendering Co. . .	61.8	62.0	7.0	3.0	9.1	22.1
4		John Reardon & Sons Co. . .	63.9	60.0	6.0	3.0	9.6	23.7
2		Wilbur-Ellis Co., Inc. . .	68.3	67.0	3.9	5.0	5.7	13.0
2		Wilmington Packing Co. . .	65.5	63.0	3.2	2.0	9.3	23.4
							Milk Sugar by Difference	
2	Milk Products Albert Lea Brand Dried Buttermilk . . . Buell-Boston Dried Skim Milk . . . Burrek-Brand Powdered Skim Milk . . . Collis Process Dried Buttermilk . . . Dairylea Choice Feed Grade Dried Skim Milk . . . Dried Skim Milk . . . Old Sol Dried Skim Milk . . . Ward's Pure Dried Skim Milk . . .	Albert Lea Food Products Co. . .	32.7	30.0	5.5	5.0	—	9.5
1		B. & B. Dairy Co., Inc. . .	37.2	33.0	0.8	0.2	50.4	8.2
3		C. W. Burekhalter, Inc. . .	33.0	32.0	1.5	0.75	51.1	8.0
2		Collis Products Co. . .	30.5	30.0	5.2	5.0	—	8.1
3		Dairymen's League Co-operative Assn., Inc. . .	34.4	33.0	1.1	0.5	51.2	7.8
1		Elm City Creamery, Inc. . .	35.0	32.0	1.3	0.25	49.7	7.7
2		General Commodity Corp. . .	33.8	32.0	1.2	0.5	51.1	7.9
1		Ward Dry Milk Co. . .	35.3	32.0	1.4	1.0	50.6	8.0

## Summary of Analyses

Season of 1935-1936

	Samples.	Brands.	Manu- facturers.
<b>Alfalfa Products</b>			
Alfalfa Meal . . . . .	17	8	7
Alfalfa Leaf Meal . . . . .	5	3	3
Alfalfa Stem Meal . . . . .	2	2	1
<b>Animal and Fish Products</b>			
Bone Meal . . . . .	6	2	2
Fish Meal . . . . .	17	10	10
Meat Scrap . . . . .	5	5	3
Meat and Bone Scrap . . . . .	20	10	6
Milk Powder . . . . .	16	9	9
<b>Brewers and Distillers By-Products</b>			
Brewers Grains . . . . .	14	5	5
Distillers Grains . . . . .	12	6	5
<b>Cereal Meals</b>			
Barley Meal . . . . .	1	—	—
Corn Meal . . . . .	32	—	—
Ground Oats . . . . .	50	—	—
Feeding Oatmeal . . . . .	6	3	3
Provender (Corn and Oats) . . . . .	24	—	—
<b>Corn Products</b>			
Gluten Feed . . . . .	35	8	7
Gluten Meal . . . . .	12	4	4
Hominy Feed . . . . .	28	10	10
<b>Miscellaneous Mill Residues</b>			
Beet Pulp . . . . .	9	3	2
Oat Feed . . . . .	7	4	3
Rye Feed . . . . .	1	1	1
Unclassified . . . . .	11	5	4
<b>Oil Cake Meals</b>			
Soy Bean Meal . . . . .	14	6	5
Cottonseed Meal . . . . .	54	13	10
Linseed Meal . . . . .	19	8	4
<b>Wheat Products</b>			
Red Dog Flour . . . . .	11	7	7
Wheat Flour Middlings . . . . .	3	2	2
Wheat Standard Middlings . . . . .	23	13	13
Wheat Mixed Feed . . . . .	42	18	17
Wheat Bran . . . . .	62	28	28
<b>Mixtures for Animals</b>			
Calf Meals . . . . .	16	9	9
Dairy Feeds . . . . .	438	199	66
Fitting Rations . . . . .	30	12	10
Hog Feeds . . . . .	11	7	7
Molasses Feeds . . . . .	100	48	34
Rabbit Feeds . . . . .	5	4	4
Stock Feeds . . . . .	54	24	21
<b>Mixtures for Poultry</b>			
Chick Growing and Starting Feeds . . . . .	162	102	53
Chick Scratch Feeds . . . . .	13	9	9
Duck Feeds . . . . .	2	2	1
Fattening Feeds . . . . .	22	12	10
Laying Feeds . . . . .	281	134	71
Turkey Feeds . . . . .	21	11	7
Totals . . . . .	1713	766	—

## Feeds Not Conforming to Guarantees.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent in fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent.	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
8	1	<b>Allied Mills, Inc.</b> Wayne Amco 20% Dairy Ration . . . . .	1.1	-	-
3	3	<b>Arcady Farms Milling Co.</b> { Arcady 24% Open Formula Production Ration . { Arcady 24% Open Formula Production Ration . { Arcady 24% Open Formula Production Ration . Arcady 20% Open Formula Production Ration .	- - - -	1.3 1.1 1.2 1.2	- - - -
7	1	{ Arcady Fitting Ration . . . . .	-	-	1.8
2	2	{ Arcady Fitting Ration . . . . .	-	-	2.2
2	1	Arcady Wonder Complete All Mash Chick Starter	-	-	2.3
2	1	<b>Berkshire Coal &amp; Grain Co., Inc.</b> Berkshire Hills Sweet Dairy Feed . . . . .	-	-	1.7
4	1	<b>A. B. Caple Co.</b> Alfalfa Meal . . . . .	-	-	1.8
1	1	<b>Central Chemical Co., Inc.</b> Gro-All Crab Meal . . . . .	7.2	-	-
3	1	<b>S. J. Cherry &amp; Sons, Ltd.</b> Canadian Pure Bran . . . . .	1.4	-	-
2	1	<b>E. A. Cowee Co.</b> Coweco 1925 Ration . . . . .	1.6	-	-
4	3	{ Dairy-Aide 24% Ration . . . . . { Dairy-Aide 24% Ration . . . . . { Dairy-Aide 24% Ration . . . . . Dairy-Aide 20% Ration . . . . .	3.3 1.3 2.1 -	- - - -	- - - 1.5
1	1	Coweco Growing Mash . . . . .	-	-	1.9
2	1	Coweco Starting Mash . . . . .	-	-	1.6
3	2	{ Coweco Starting Mash . . . . . { Coweco Starting Mash . . . . .	1.3 -	- -	2.3 -
1	1	<b>Frank Diauto</b> Diauto's Broiler Ration . . . . .	-	-	2.1
2	1	<b>J. L. Dunnell &amp; Son</b> Full Value Mixed Feed . . . . .	-	1.2	-
3	1	<b>Elmore Milling Co., Inc.</b> Dairymans Emergency Ration . . . . .	2.0	-	1.9
4	1	Elmore's Sweet Digesto Dairy Feed . . . . .	-	-	1.6
5	1	<b>John W. Eshelman &amp; Sons</b> Eshelman Conestoga 20 Dairy Feed . . . . .	1.2	-	-
1	1	Eshelman S-O-S . . . . .	-	1.7	-
5	2	<b>Excelsior Milling Co.</b> { Pure Camel Fancy Wheat Feed . . . . . { Pure Camel Fancy Wheat Feed . . . . .	2.0 1.4	- -	- -
3	3	<b>Farm Service Stores, Inc.</b> { Diamond A Dairy Ration . . . . . { Diamond A Dairy Ration . . . . . { Diamond A Dairy Ration . . . . . Diamond C Dairy Feed . . . . .	- - - -	1.1 1.3 - 1.2	2.1 2.7 3.0 -
4	4	{ Diamond C Dairy Feed . . . . . { Diamond C Dairy Feed . . . . . { Diamond C Dairy Feed . . . . . Diamond C Dairy Feed . . . . .	- - - -	1.2 1.2 1.5 1.9	- - 2.0 2.4
1	1	Lawrence Cow Ration . . . . .	1.3	-	-
1	1	New England Dairy Ration . . . . .	-	-	2.6
4	1	North Star Stock Feed . . . . .	-	-	2.5
3	1	C Growing Mash . . . . .	3.6	-	-
3	1	<b>Fernando Valley Milling &amp; Supply Co.</b> Fernando Ideal Greens Alfalfa Leaf Meal . . . . .	-	-	2.7

## Feeds Not Conforming to Guarantees — Continued

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent in fiber are not listed.)

Samples Collected	Samples Not Conforming to Guarantee	Manufacturer and Brand.	Protein Deficiency Per Cent	Fat Deficiency Per Cent	Fiber Excess Per Cent
3	1	<b>Flory Milling Co., Inc.</b>			
1	1	Record Dairy Feed . . . . .	1.1	-	-
		Flory's 32% Protein Supplement Mash . . . . .	2.6	-	-
1	1	<b>Geneva Milling Co. Inc.</b>			
		Genesota Red Dog . . . . .	-	1.4	-
4	3	<b>W. K. Gilmore &amp; Sons, Inc.</b>			
		{ Conference Mash . . . . .	1.5	-	-
		{ Conference Mash . . . . .	1.0	-	-
		{ Conference Mash . . . . .	1.4	-	-
3	1	<b>Goode Grain Co.</b>			
		Goode Laying Mash . . . . .	2.8	-	-
4	2	<b>D. H. Grandin Milling Co.</b>			
		Grandin's 12-Twin Six-12 Dairy Feed . . . . .	1.7	-	-
		Grandin's 12-Twin Six-12 Dairy Feed . . . . .	1.3	-	-
2	1	<b>Great Atlantic &amp; Pacific Tea Co.</b>			
		Milky Way Dairy Feed 24% . . . . .	-	1.2	-
14	1	<b>Humphreys-Godwin Co.</b>			
		Dixie Brand Prime 41% Protein Cottonseed Meal . . . . .	1.2	-	-
2	1	<b>International Vegetable Oil Co., Inc.</b>			
		High Grade Cottonseed Meal . . . . .	1.4	-	3.5
3	1	<b>Jaquith &amp; Co.</b>			
		Dairy Ration . . . . .	-	-	2.1
9	1	<b>L. B. Lovitt &amp; Co.</b>			
		"Lovit Brand" 41% Protein Cottonseed Meal . . . . .	1.2	-	-
1	1	<b>Maine Fish Meal Co.</b>			
		Maine Vitamin D Fish Meal . . . . .	-	5.4	-
1	1	<b>Geo. O. Moon &amp; Co., Inc.</b>			
3	1	Moon's Fresh Ground Wheat Middlings . . . . .	1.2	-	-
		U. S. 24% Dairy Ration . . . . .	1.9	-	-
3	2	<b>National Mineral Products Co., Ltd.</b>			
		{ California Alfalfa Leaf Meal . . . . .	-	-	3.1
		{ California Alfalfa Leaf Meal . . . . .	-	-	2.7
4	3	<b>Niagara Falls Milling Co.</b>			
		{ Choice Wheat Red Dog . . . . .	-	1.1	-
		{ Choice Wheat Red Dog . . . . .	-	1.1	-
		{ Choice Wheat Red Dog . . . . .	-	1.2	-
3	1	<b>Ogden Grain Co.</b>			
		24% Ograinco Milk Ration . . . . .	-	1.3	-
2	1	<b>Park &amp; Pollard Co.</b>			
1	1	Bidwell 20% Dairy Ration . . . . .	-	1.5	-
		Manamar Lay or Bust Mash . . . . .	-	-	2.3
4	1	<b>Parrish &amp; Heimbecker, Ltd.</b>			
		Parrheim Pure Wheat Bran . . . . .	1.5	-	-
7	2	<b>Pecos Valley Alfalfa Mill Co.</b>			
		{ Pevsee Alfalfa Leaf Meal . . . . .	-	-	5.6
		{ Pevsee Alfalfa Leaf Meal . . . . .	-	-	2.0
2	1	<b>Penick &amp; Ford Ltd., Inc.</b>			
		Douglas Gluten Meal . . . . .	3.1	-	-



## Feeds Not Conforming to Guarantees — Concluded.

(Shortages of less than one per cent in protein or fat or an excess of less than one per cent in fiber are not listed.)

Samples Collected.	Samples Not Conforming to Guarantee.	Manufacturer and Brand.	Protein Deficiency Per Cent	Fat Deficiency Per Cent.	Fiber Excess Per Cent.
1	1	<b>Phaneuf &amp; Son</b> O Boy All Mash Starter . . . . .	2.9	-	-
3	1	<b>Maurice Pincoffs Co.</b> 41% Protein Cottonseed Meal . . . . .	1.2	-	-
2	1	<b>John Reardon &amp; Sons Co.</b> 50% Register Brand Meat & Bone Scraps. . . . .	3.0	-	-
4	1	Rearco Bone Meal for Feed . . . . .	-	1.5	-
2	2	<b>H. M. Rubin Co., Inc</b> { Rubco Meat Bone Scrap . . . . . { Rubco Meat Bone Scrap . . . . .	3.3 2.8	- -	- -
2	1	<b>St. Albans Grain Co.</b> Wirthmore Laying Mash with Cod Liver Oil . . . . .	1.1	-	-
1	1	<b>Smith, Bodfish, Swift Co.</b> Paramount Laying Mash . . . . .	1.4	-	-
1	1	<b>F. W. Stock &amp; Sons</b> Stock's Bran . . . . .	2.9	-	-
2	2	<b>H. K. Webster Co.</b> { Blue Seal Stock Feed . . . . . { Blue Seal Stock Feed . . . . .	- -	- -	2.5 2.5
2	1	<b>West-Nesbitt, Inc.</b> Super Pure Sweetfeed Dairy Ration . . . . .	1.1	-	-
2	2	<b>Wilbur-Ellis Co., Inc.</b> { Lighthouse Brand Fish Meal . . . . . { Lighthouse Brand Fish Meal . . . . .	- -	1.1 1.3	- -
2	1	<b>Stanley Wood Grain Co.</b> Woods Dairy Ration . . . . .	1.4	-	-

**Certified Ingredients.**

Allied Mills, Inc.

**Empire 20% Dairy Ration**

Soybean oil meal, cottonseed meal, wheat bran, ground and bolted screenings from flax, wheat, corn, oats and barley, clipped oat by-products, cane molasses, 2% ground limestone and 1% salt.

**Empire 16½% Dairy Ration**

Corn distillers' dried grains, brewers' dried grains, soybean oil meal, corn gluten feed, corn gluten meal, cottonseed oil meal, corn meal, wheat bran, ground and bolted screenings from flax, wheat, corn, oats and barley, clipped oat by-products, cane molasses, 1% ground limestone and 1% salt.

**Empire Egg Mash**

Dried buttermilk, dried skim milk, meat scraps, fish meal, soybean oil meal, choice alfalfa meal, wheat bran, wheat standard middlings, corn gluten feed, corn meal, fine ground oats, 1% ground limestone and 1% salt.

**Empire Egg Mash with Sardine Oil**

Dried buttermilk, dried skim milk, meat scraps, fish meal, soybean oil meal, choice alfalfa meal, wheat bran, wheat standard middlings, corn gluten feed, corn meal, fine ground oats, 1% ground limestone, 1% salt and sardine oil.

**Empire Growing Mash**

Corn meal, wheat bran, soybean oil meal, fine ground oats, meat scraps, fish meal, wheat standard middlings, choice alfalfa meal, corn gluten feed, dried skim milk, dried buttermilk, 1% fat and 1% ground limestone.

**Wayne Amco 24% Dairy Ration**

Cottonseed meal, corn gluten meal, corn distillers' dried grains, brewers' dried grains, corn gluten feed, old process linseed oil meal, soybean oil meal, peanut oil meal, ground oats, corn meal and hominy meal, wheat bran, cane molasses, 0.5% steamed bone meal, 1.265% ground limestone, 1.2% salt, 0.0345% iron oxide and 0.0005% potassium iodide.

**Wayne Amco 20% Dairy Ration**

Cottonseed meal, brewers' dried grains, corn distillers' dried grains, ground oats, corn gluten feed, corn meal and hominy meal, soybean oil meal, corn gluten meal, old process linseed oil meal, wheat bran, cane molasses, 0.5% steamed bone meal, 1.265% ground limestone, 0.0345% iron oxide, 1.2% salt and 0.0005% potassium iodide.

**Wayne Amco 16% Dairy Ration**

Corn distillers' dried grains, corn gluten feed, old process linseed oil meal, corn meal, hominy meal, soybean oil meal, ground oats, wheat bran, cane molasses, 0.5% steamed bone meal, 1% ground limestone, 1% salt, 0.03% iron oxide and 0.0005% potassium iodide.

**Wayne Amco 32% Supplement Dairy Ration**

Soybean oil meal, corn gluten meal, corn distillers' dried grains, cottonseed meal, peanut oil meal, corn gluten feed, old process linseed oil meal, wheat bran, cane molasses, 0.75% steamed bone meal, 2% ground limestone, 1.2% salt, 0.0495% iron oxide and 0.0005% potassium iodide.

**Wayne Breeder Mash**

Fish meal, meat scraps, dried buttermilk, dried skim milk, soybean oil meal, choice alfalfa meal, wheat bran, corn meal, corn germ oil meal, wheat standard middlings, fine ground oats, crab meal, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt and sardine oil.

**Wayne Broiler Ration**

Dried buttermilk, dried skim milk, meat scraps, fish meal, ground yellow corn, fine ground oats, wheat standard middlings, wheat bran, soybean oil meal, choice alfalfa meal, 1.5% ground limestone, 0.04% iron oxide, 0.0005% potassium iodide, 0.25% salt and sardine oil.

**Wayne Chick Starter**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, fine ground oats, choice alfalfa meal, soybean oil meal, wheat bran, 1.5% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt and sardine oil.

**Wayne Egg & Breeder Mash with Sardine Oil**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, wheat bran, corn meal, fine ground oat meal, corn gluten feed, choice alfalfa meal, soybean oil meal, fine ground oats, 2% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt and sardine oil.

**Wayne Growing Mash with Sardine Oil**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, fine ground oats, choice alfalfa meal, soybean oil meal, wheat bran, 1.5% ground limestone, 0.06% iron oxide, 0.0007% potassium iodide, 0.25% salt and sardine oil.

**Wayne Poultry Fattener**

Ground yellow corn, corn germ oil meal, white hominy feed, rolled oats, oat flour, fine ground oats, wheat standard middlings, wheat red dog, old process linseed oil meal and 1% salt.

**Wayne Turkey Starting Mash**

Dried buttermilk, dried skim milk, meat scraps, fish meal, wheat standard middlings, corn meal, choice alfalfa meal, soybean oil meal, wheat bran, fine ground oats, 1% charcoal, 2% ground limestone, 0.15% iron oxide, 0.002% potassium iodide, 0.5% salt and sardine oil.

## A. P. Ames Co.

**Ames Complete Growing Egg Ration**

Dried skim milk, pulverized whole oats, corn meal, wheat bran, wheat middlings, leaf alfalfa meal, meat scraps, fish meal, calcium carbonate, salt, and cod liver oil.

**Ames Complete Starter and Broiler Ration**

Corn meal, wheat middlings, dried skim milk, pulverized whole oats, wheat bran, alfalfa leaf meal, cod fish meal, meat scraps, calcium carbonate, salt and Clo-Trate concentrated cod liver oil.

**Ames Egg Mash**

Corn meal, wheat middlings, pulverized whole oats, wheat bran, cod fish meal, meat scraps, alfalfa leaf meal, dried skim milk, calcium carbonate, salt, Clo-Trate concentrated cod liver oil.

**Ames 20% Milk Maker**

Gluten, corn meal (and, or hominy), wheat bran, wheat middlings, linseed meal (and, or soybean oil meal, and, or cottonseed meal), oat feed, calcium carbonate, bone meal and salt.

## Arcady Farms Milling Co.

**Arcady 20% Open Formula Production Ration**

Soy bean oil meal, cottonseed meal, o. p. linseed oil meal, standard wheat bran, brewers dried grains, corn gluten feed, corn gluten meal, ground white oats, corn meal, cane molasses, 1% steamed bone meal, 1% calcium carbonate from limestone, 1% salt.

**Arcady-Wonder Growing Mash**

Fish meal, meat scraps, animal liver meal, dried buttermilk, o.p. linseed oil meal, corn gluten feed, corn meal, wheat bran, wheat middlings, alfalfa meal, fortified cod liver oil, soy bean oil meal, ground oats, bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt,  $1\frac{1}{2}$  oz. potassium iodide per ton.

**Arcady-Wonder Laying Mash**

Fish meal, meat scraps, animal liver meal, soy bean oil meal, dried buttermilk, o.p. linseed oil meal, oat meal, corn meal, corn gluten feed, alfalfa meal, fine ground oats, wheat bran, wheat middlings, fortified cod liver oil, bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt,  $1\frac{1}{2}$  oz. potassium iodide per ton.

## W. E. Atkinson Co.

**Weaco Dry Mash**

Corn meal, bran, middlings, ground oats, meat scraps, gluten feed, dried skim milk, alfalfa leaf meal, fish meal, calcium carbonate, salt, cod liver oil.

## Barber &amp; Bennett, Inc.

**Big Ben Brand 20% Dairy Feed**

Ground screenings from wheat, corn and oats, corn gluten feed, ground barley, wheat bran (may contain mill run screenings), soybean oil meal, rye and corn distillers' grains, cane molasses, calcium carbonate from limestone, steamed bone meal, 1% salt, potassium iodide, not less than .0017% iodine.

**Double Value 24% Dairy Feed**

Corn gluten feed, wheat bran (may contain mill run screenings), hominy feed and corn meal, corn distillers' grains, soybean oil meal, ground barley, palm kernel meal, cane molasses, steamed bone meal, salt.

**Double Value 20% Dairy Feed**

Corn gluten feed, wheat bran (may contain mill run screenings), hominy feed and corn meal, corn distillers' grains, soybean oil meal, ground barley, palm kernel meal, cane molasses, steamed bone meal, salt.

## Beacon Milling Co., Inc.

**Auburn Brand Auburn Dairy Feed**

Corn gluten feed, old process linseed oil meal, soybean oil meal, ground oats, corn meal, ground grain screenings, cottonseed meal, wheat bran, ground barley, brewer's dried grains, corn distiller's dried grains, molasses, 1% salt, 1% calcium carbonate, 1% calcium phosphate.

**Beacon's Cayuga Growing Mash**

Dried skim milk, fish meal, meat scrap, pulverized heavy oats, corn meal, pulverized heavy barley, wheat bran, wheat middlings, dehydrated alfalfa leaf meal, anti-rachitic oil, 2% calcium carbonate,  $\frac{1}{2}$ % salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon Complete Starting Ration**

Dried skim milk, meat scrap, fish meal, ground yellow corn, ground hulled oats, pulverized heavy oats, pulverized heavy barley, wheat bran (may contain mill run screenings), wheat red dog flour, dehydrated alfalfa leaf meal, anti-rachitic oil, 2% calcium carbonate,  $\frac{1}{2}$ % salt.

**Beacon Dairy Ration**

Old process linseed oil meal, soy bean oil meal, corn gluten feed, corn distiller's dried grains, ground barley, corn gluten meal, hominy feed, corn meal, cottonseed meal, ground oats, wheat bran, wheat middlings, 1% calcium carbonate, 1% calcium phosphate, 1% salt. (Wheat bran or middlings may contain mill run screenings.)

**Beacon Duck Breeder Pellets**

Dried skim milk, meat scrap, fish meal, corn meal, pulverized heavy barley, wheat bran (may contain mill run screenings), wheat red dog flour, ground oat groats, dehydrated alfalfa leaf meal, anti-rachitic oil, 2% calcium carbonate,  $\frac{1}{4}$ % salt.

**Beacon Duck Laying Pellets**

Dried skim milk, meal scrap, fish meal, corn meal, pulverized heavy barley, pulverized heavy oats, wheat bran (may contain mill run screenings), wheat red dog, dehydrated alfalfa leaf meal, old process linseed oil meal, soy bean oil meal, anti-rachitic oil, 2% calcium carbonate,  $\frac{1}{4}$  % salt.

**Beacon Fleshing Pellets**

Dried skimmilk, pulverized heavy oats, pulverized heavy barley, wheat low grade flour, corn meal, corn oil meal, wheat germ meal, anti-rachitic oil,  $2\frac{1}{2}$  % calcium carbonate, 1% salt.

**Beacon Sweet "24"**

Old process linseed oil meal, soy bean oil meal, corn gluten meal, cottonseed meal, corn gluten feed, corn meal, brewer's dried grains, corn distiller's dried grains, wheat bran (may contain mill run screenings), ground oats, ground barley, molasses, 1% salt, 1% calcium carbonate.

**Beacon Sweet "20"**

Old process linseed oil meal, soy bean oil meal, corn distiller's dried grains, cottonseed meal, wheat bran, wheat middlings, brewer's dried grains, corn gluten meal, corn gluten feed, ground barley, corn meal, ground oats, molasses, 1% calcium carbonate, 1% salt. (Wheat bran or middlings may contain mill run screenings.)

**Berkshire Coal & Grain Co., Inc.****Berkshire Hills Sweet Dairy Feed**

Wheat bran, cottonseed meal, corn gluten feed, linseed oil meal, corn meal, ground oats, brewers grains, calcium carbonate, cane molasses and salt.

**Green Mountain Dairy Ration**

Wheat bran, cottonseed meal, corn gluten feed, linseed oil meal, corn meal, ground oats and barley, calcium carbonate, salt.

**Green Mountain Laying Mash**

Wheat bran, wheat middlings, linseed oil meal, corn meal, fine ground oats, alfalfa meal, meat scraps, bone meal, fish meal, dried skim milk, calcium carbonate, salt, Nopeco XX cod liver oil.

**Borden Grain Co.****Borden's Dairy Feed**

Wheat bran, wheat middlings, corn meal (or hominy), gluten meal, gluten feed, cottonseed meal, soy bean oil meal, linseed oil meal, calcium carbonate, bone meal, salt.

**Borden's Laying Mash**

Corn meal, wheat bran, wheat middlings, ground oat meal, dried milk, alfalfa leaf meal, fish meal, meat scrap, soy bean oil meal, cod liver oil, calcium carbonate, salt.

**Geo. B. Brown****Brown's Dairy Feed**

Hominy feed, corn meal, wheat bran, o. p. linseed meal, oat feed, corn gluten feed, cottonseed meal, molasses, calcium carbonate, bone meal, salt.

**Brown's Egg Mash**

Corn meal, dried milk, wheat middlings, leaf alfalfa meal, ground oats, charcoal, wheat bran, calcium carbonate, meat scraps, salt, bone meal, cod liver oil.

**Community Feed Stores, Inc.****Community-20 Dairy Ration**

Corn distillers dried grains, 41% cotton seed meal, soya bean meal, corn gluten feed, yellow corn meal or hominy, pure ground oats, wheat bran, molasses, salt, calcium carbonate.

**Community Growing Mash**

Yellow corn meal or hominy, pure ground oats, wheat bran, wheat middlings, alfalfa meal, soya bean meal, dried milk, choice meat scraps, pure fish meal, oyster shell meal, salt, cod liver oil.

**Community Laying Mash**

Yellow corn meal or hominy, pure ground oats, wheat bran, gluten, wheat middlings, choice meat scraps, soya bean meal, dried milk, alfalfa meal, salt, calcium carbonate, oyster shell meal, cod liver oil.

**Hilltop-20 Dairy Ration**

41% cottonseed meal, corn gluten feed, hominy or corn meal, Vim oat mill feed, wheat bran, corn distillers dried grains, cane molasses, calcium carbonate, salt, soya bean meal.

**Nicolas Courcy Grain Co.****Courcy's Dairy Feed**

Bran, middlings, Buffalo gluten, Diamond gluten, 41% cottonseed, linseed, meal or hominy, dairy salt, calcite flour.

**Courcy's Eastern Laying Mash**

Meal, wheat bran, ground oats, 45% beef scrap, middlings (standard), ground wheat, alfalfa leaf meal, fish meal, milk, calcite flour, salt, cod liver oil XX.

**E. A. Cowee Co.****Coweco All Mash Ration**

Corn meal, ground wheat, cut oat groats, wheat bran, wheat middlings, soybean meal, alfalfa leaf meal, meat scraps, fish meal, dried milk, ground barley, edible bone meal, calcium carbonate, salt, cod liver oil.

**Coweco Growing Mash**

Wheat bran, middlings, corn meal, hominy, pulverized oats, ground barley, soybean meal, alfalfa leaf meal, red dog flour, calf meal, meat scraps, fish meal, dried milk, edible bone meal, calcium carbonate, salt, with or without molasses, with or without cod liver oil.

**Coweco Laying Mash**

Wheat bran, middlings, oat meal, gluten feed, ground barley, soybean meal, meat scraps, fish meal, corn meal, dried milk, alfalfa leaf meal, edible bone meal, calcium carbonate, salt, with or without molasses, with or without cod liver oil.

**Coweco 1925 Ration**

Wheat bran, middlings, corn meal, cottonseed meal, gluten feed, oil meal, coconut oil meal, hominy, ground oats, distillers grains, brewers grains, soybean meal, edible bone meal, salt, calcium carbonate and molasses.

**Coweco 20% Ration**

Wheat bran, middlings, corn meal, gluten feed, distillers grains, oil meal, soybean meal, coconut oil meal, ground oats, cottonseed meal, brewers grains, malt sprouts, edible bone meal, calcium carbonate, salt and molasses.

**Coweco Starting Mash**

Wheat bran, middlings, corn meal, oat meal, alfalfa leaf meal, soybean meal, fish meal, meat scraps, edible bone meal, dried milk, calcium carbonate, salt, with or without molasses, with or without cod liver oil.

**Coweco Sunrise Complete Starting & Broiler Ration**

Meal, bran, middlings, pulverized oats, ground wheat, soybean meal, beef scraps, alfalfa leaf meal, fish scraps, dried milk, bone meal, calcium carbonate, salt, cod liver oil.

**Coweco Sunrise 20% Dairy Ration**

Bran, middlings, meal, hominy, cottonseed meal, gluten feed, oil meal, ground barley, dried brewers grains, soybean meal, distillers grains, coconut oil meal, malt sprouts, bone meal, calcium carbonate, salt and molasses.

**Coweco Sunrise Growing Mash**

Wheat bran, middlings, corn meal, red dog, hominy, copra meal, soybean meal, dried milk, ground alfalfa, beef scraps, fish scraps, bone meal, calcium carbonate, salt and cod liver oil, ground barley.

**Coweco Sunrise Laying Mash**

Wheat bran, middlings, corn meal, hominy, ground oats and barley, gluten, dried milk, soybean meal, meat scraps, alfalfa meal, edible bone meal, calcium carbonate, salt, with or without cod liver oil.

**Dairy-Aide 24% Ration**

Bran, middlings, ground barley, brewers grains, distillers grains, reground grain screenings, soybean meal, cottonseed meal, peanut meal, molasses, calcium carbonate, bone meal and salt.

**Dairy-Aide 20% Ration**

Wheat bran, middlings, ground barley, brewers grains, distillers grains, reground grain screenings, soybean meal, cottonseed meal, peanut meal, bone meal, calcium carbonate, salt and molasses.

Chas. M. Cox Co.

**Utility Growing Ration**

Dried skim milk, ground oats, alfalfa meal, wheat bran, gluten feed, ground barley, fish meal cod liver oil, wheat middlings, calcium carbonate, meat scrap, yellow corn meal, soy bean meal, gluten meal, salt.

**Utility Starting Ration**

Dried skim milk, cod liver oil, soy bean meal, wheat middlings, ground oats, ground barley, fish meal, wheat bran, ground wheat, calcium carbonate, meat scrap, yellow corn meal, gluten meal, alfalfa meal, salt.

**Utility Laying Ration**

Dried skim milk, meat scrap, fish meal, alfalfa meal, gluten meal, ground barley, ground wheat, yellow corn meal, wheat bran, wheat middlings, gluten feed, cod liver oil, ground oats, calcium carbonate, salt.

Curley Brothers

**Crystal All Grain Starting Food**

Pure dry buttermilk, cod liver oil, yellow corn meal, ground oat groats, red dog flour, bran, alfalfa leaf meal, cracked wheat, fine cracked corn, steelcut oatmeal, steamed edible bone meal, powdered charcoal, salt, calcium carbonate, white fish meal.

**Crystal 24% Dairy Ration**

Corn gluten meal, corn gluten feed, cottonseed meal, linseed oil meal, distillers grains, hominy feed, ground barley, ground oats, bran and middlings with mill run of screenings, edible bone meal, salt, calcium carbonate.

**Crystal 20% Dairy Ration**

Corn gluten feed, yellow corn meal, hominy feed, bran and middlings with mill run of screenings, cottonseed meal, linseed oil meal, beet pulp, steamed edible bone meal, calcium carbonate, salt.

**Crystal Egg Mash**

Linseed oil meal, yellow hominy feed, yellow corn meal, bran and middlings, with mill run of screenings, feeding oatmeal, red dog, alfalfa poultry greens, beef scraps, fish scraps, steamed bone meal, dried skim milk, salt, calcium carbonate.

**Crystal Growing Mash**

Cod liver oil, dried skim milk, meat scraps, white fish meal, steamed edible bone meal, alfalfa poultry greens, red dog flour, bran and middlings with mill run of screenings, feeding oatmeal, yellow hominy feed, yellow corn meal, calcium carbonate, salt.

**Premier Growing Mash**

Meal, bran, middlings, red dog, ground barley, ground oats, dried skim milk, linseed oil meal alfalfa leaf meal, meat meal, fish meal, bone meal, calcite, salt.

Cutler Co.

**King Complete Chick Starter and Broiler Ration**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), ground oat groats, meat scraps, fish meal, alfalfa leaf meal, corn gluten meal, soybean oil meal, yellow corn meal, wheat bran, wheat middlings, calcium carbonate and salt.

**King Complete Growing Ration**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, soybean oil meal, corn gluten meal, ground yellow corn, ground wheat, ground oats, ground barley, wheat bran, wheat middlings, alfalfa leaf meal, calcium carbonate and salt.

**King 20 Dairy Feed Sweetened**

Fortified cod liver oil, corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, cottonseed meal, corn gluten feed, yellow corn meal, ground oats, ground barley, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

**King Growing Mash**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, alfalfa leaf meal, old process linseed meal, ground wheat, oats, barley, soybean oil meal, corn gluten meal, wheat bran, wheat middlings, wheat red dog, calcium carbonate and salt.

Delaware Mills, Inc.

**Delaware All Mash Chick Starter**

Cod liver oil, dried skim milk, meat scrap, fish meal, oatmeal, alfalfa leaf meal, corn meal, wheat bran, wheat middlings, wheat reddog flour, bone meal, phosphatic calcium carbonate, charcoal and salt.

**Delaware Sweet 24% Dairy Feed**

Cane molasses, corn gluten feed, corn gluten meal, linseed oil meal, cottonseed meal, soybean oil meal, hominy feed, peanut oil meal, corn meal, wheat bran, wheat middlings, salt, phosphatic calcium carbonate.

**Delaware Laying Mash**

Cod liver oil, dried skim milk, meat scrap, bone meal, fish meal, soybean oil meal, corn gluten feed, corn meal, wheat bran, wheat middlings, wheat red dog flour, oatmeal, ground barley, alfalfa leaf meal, phosphatic calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**Delco 20% Dairy Feed**

Dried beet pulp, linseed oil meal, corn gluten feed, corn gluten meal, soybean oil meal, peanut oil meal, cottonseed meal, wheat bran, wheat middlings, hominy feed, ground oats, salt, phosphatic calcium carbonate.

**Delco Sweet 20% Dairy Feed**

Cane molasses, linseed oil meal, corn gluten feed, corn gluten meal, cottonseed meal, soybean oil meal, peanut oil meal, wheat bran, wheat middlings, hominy feed, ground oats, ground barley, phosphatic calcium carbonate, salt.

**Indian Growing Mash**

Dried skim milk, meat scrap, fish meal, bone meal, soybean oil meal, alfalfa meal, wheat bran, wheat middlings, corn meal, ground barley, ground oats, phosphatic calcium carbonate and salt.

**Indian Sweet 20% Dairy Feed**

Cane molasses, linseed oil meal, corn gluten feed, cottonseed meal, soybean oil meal, peanut oil meal, wheat bran, wheat middlings, corn meal, reground oatfeed, ground buckwheat, phosphatic calcium carbonate and salt.

**Indian Laying Mash**

Dried skim milk, meat scrap, fish meal, bone meal, soybean oil meal, corn gluten feed, alfalfa meal, wheat bran, wheat middlings, corn meal, ground barley, ground oats, phosphatic calcium carbonate and salt.

Frank Diauto

**Diauto's Special Egg Mash**

Linseed meal, cod liver oil, corn meal, bran, middlings, ground oats, oat meal, oyster shell meal, meat scraps 50%, fish meal, dried milk, bean meal, ground barley, salt.

**Diauto's Broiler Ration**

Soy bean meal, yellow meal, bran, wheat flour middlings, ground oats, skim milk, alfalfa leaf meal, meat scraps 50%, cod liver oil, calcium carbonate, salt, fish meal 55%.

**Diauto's Dairy Feed**

Gluten feed, corn meal, ground oats, bran, linseed meal, cottonseed meal, salt.

**Diauto's Fancy Chick Growing Mash**

Middlings, bran, ground oats, oat meal, alfalfa meal, oyster shell meal, meat scraps 50%, dried milk, bean meal, salt, cod liver oil, corn meal, fish meal.



**F. Diehl & Son, Inc.****Diehl's Dairy Feed**

Bran, brewers grains, cottonseed meal, gluten, linseed meal, corn meal, oat meal mill by-products, ground barley, pure ground oats, wheat middlings, salt, calcium carbonate, bone meal, sweetened.

**Diehl's Dry Mash**

Alfalfa, Banner feed, bone, dried milk, charcoal, fish scraps, gluten meal, linseed, meal, meat scraps, middlings and red dog.

**Dietrich & Gambrill, Inc.****All Purpose Complete Ration Starter-Grower-Layer**

Coarse ground yellow corn, coarse ground wheat, pulverized oats, flour middlings, wheat bran, alfalfa leaf meal, dried buttermilk, meat scrap, fish meal, soy bean meal, steamed bone meal, 1 % calcium carbonate, 1 % salt, cod liver oil, potassium iodide.

**D. & G. Dairy Feed**

Cottonseed meal, peanut meal, linseed meal, gluten feed, corn feed meal, wheat bran, ground grain screenings, clipped oat byproducts, oat middlings, oat shorts, oat hulls, molasses, 1 % bone meal, 1 % calcium carbonate, 1 % salt, potassium iodide.

**D. & G. Poultry Conditioning Ration**

Cracked wheat, fine chick corn, corn meal, reddog, pulverized oats, wheat bran, alfalfa leaf meal, dried buttermilk, fish meal, meat scrap, soy bean meal, grit, bone meal, calcium carbonate, salt, mineral oil, peanut oil, cod liver oil, potassium iodide.

**D. & G. Turkey Growing Mash**

Pure corn meal, wheat bran, wheat middlings, pulverized oats, oat meal, alfalfa meal, soy bean meal, linseed meal, meat scrap, dried buttermilk, bone meal, 1 % calcium carbonate, 1 % salt, potassium iodide.

**Frederick Growing Mash**

Wheat middlings, wheat bran, pulverized oats, corn feed meal, gluten feed, ground barley; soy bean meal, meat scrap, dried buttermilk, alfalfa leaf meal, bone meal, 1 % calcium carbonate, 1 % salt, potassium iodide.

**Frederick Laying Mash**

Wheat bran, wheat middlings, corn feed meal, pulverized oats, ground barley, gluten meal, meat scrap, fish meal, alfalfa meal, soy bean meal, bone meal, 1 % calcium carbonate, 1 % salt, dried buttermilk, potassium iodide.

**Gambrill's Chick Starter**

Oat meal, corn meal, malt flour, alfalfa leaf meal, wheat flour middlings, soy bean meal, fish meal, meat scrap, dried buttermilk, cod liver oil, bone meal, 1 % calcium carbonate, 1 % salt, potassium iodide.

**Gambrill's 16% Dairy Feed**

Cottonseed meal, peanut meal, gluten feed, wheat bran, corn feed meal, ground grain screenings from wheat, clipped oat byproducts, oat middlings, oat shorts, oat hulls, molasses, 1 % bone meal, 1 % calcium carbonate, 1 % salt, potassium iodide.

**Gambrill's Growing Mash**

Wheat bran, wheat middlings, corn feed meal, soy bean meal, malt flour, oat meal, gluten meal, meat scrap, fish meal, dried buttermilk, cod liver oil, alfalfa leaf meal, bone meal, 1 % calcium carbonate, 1 % salt, potassium iodide.

**J. L. Dunnell & Son****Excel 20 per cent Dairy Ration**

Corn meal, gluten feed, cottonseed meal, wheat bran, ground oats, salt, bone meal, calcium carbonate.

**Excel Mash**

Corn meal, gluten feed, wheat bran, ground oats, reddog, fish scraps, dried milk, lime, salt and beef scraps.

**East Bridgewater Farmers' Exchange****Special Dairy Feed**

Beet pulp, bone meal, wheat bran, cottonseed meal, distillers' grain, Diamond gluten meal, ground oats, linseed meal, corn meal, or hominy, wheat middlings, molasses, salt, soy bean meal, brewer's grain.

**Special Growing Feed**

Fish meal, alfalfa leaf meal, beef scraps, ground barley, wheat bran, cod liver oil, dried skim milk, ground oats, wheat middlings, corn meal, reddog, calcium carbonate, soy bean meal, ground wheat.

**Special Mash Feed**

Yellow corn meal, wheat bran, reddog flour, fine ground beef scraps, alfalfa leaf meal, ground oats, ground barley, ground wheat, wheat middlings, dried skim milk, cod liver oil, soy bean meal, calcium carbonate.

**Eastern Grain Co.****Eastern 24% Dairy Ration Sweetened**

Wheat bran, wheat middlings, cottonseed meal, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten meal, brewers grains, ground barley, corn meal, hominy, pure cane molasses, soy bean meal, high grade bone meal, calcium carbonate, salt.

**Eastern 20% Dairy Ration Sweetened**

Wheat bran, wheat middlings, cottonseed meal, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten meal, brewers grains, ground barley, corn meal, pure cane molasses, hominy, soy bean meal, high grade edible bone meal, calcium carbonate, salt.

**Eastern States Farmers' Exchange****Eastern States All-Mash Developer**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), wheat flour middlings, E. S. ground oats, E. S. ground barley, alfalfa leaf meal, 41% prot. soybean oil meal, dried skimmed milk, 50% protein meat scraps, 58% protein fish meal, oyster shell meal, dicalcium phosphate, sardine oil, salt.

**Eastern States Combination (Mash or Pelleted)**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), wheat flour middlings, E. S. ground oats, dried skimmed milk, alfalfa leaf meal, 50% protein meat scraps, 58% protein fish meal, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Eastern States Developer**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), wheat flour middlings, E. S. ground barley, E. S. ground oats, dried skimmed milk, 41% protein soybean oil meal, alfalfa leaf meal, 50% protein meat scraps, 58% protein fish meal, oyster shell meal, dicalcium phosphate, sardine oil, salt.

**Eastern States Egg Mash**

Wheat standard middlings, E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), E. S. ground barley, 58% protein fish meal, 50% protein meat scraps, 41% protein soybean oil meal, E. S. ground oats, alfalfa leaf meal, corn gluten meal, oyster shell meal, sardine oil, salt.

**Eastern States Fattener Mash**

E. S. yellow corn meal, corn oil meal, ground oat groats, dried skimmed milk, wheat standard middlings, wheat red dog, E. S. ground oats, 41% protein soybean oil meal, salt.

**Eastern States Fulpail Dairy Ration**

E. S. yellow corn feed meal, distillers' corn dried grains, wheat bran (may contain mill run wheat screenings), E. S. ground oats, 41% protein cottonseed meal, prime quality, 41% protein soybean oil meal, corn gluten feed, cane molasses, 37% protein old process linseed meal, E. S. ground barley, dicalcium phosphate, salt.

**Eastern States Highland 20 Dairy Ration**

Oat mill feed (oat hulls, oat shorts, oat middlings), distillers' corn dried grains, 41% protein cottonseed meal, prime quality, cane molasses, 41% protein soybean oil meal, E. S. yellow corn feed meal, E. S. ground barley, wheat bran (may contain mill run wheat screenings), corn gluten feed, 45% protein peanut oil meal, calcium carbonate, salt.

**Eastern States Highland 16 Dairy Ration**

E. S. yellow corn feed meal, oat mill feed (oat hulls, oat shorts, oat middlings), distillers' corn dried grains, cane molasses, E. S. ground barley, wheat bran (may contain mill run wheat screenings), corn gluten feed, 41% protein cottonseed meal, prime quality, 41% protein soybean oil meal, 45% protein peanut oil meal, calcium carbonate, salt.

**Eastern States Highland 12**

E. S. yellow corn meal, oat mill feed (oat hulls, oat shorts, oat middlings), wheat bran (may contain mill run wheat screenings), E. S. ground barley, cane molasses, distillers' corn dried grains, 41% protein soybean oil meal, alfalfa leaf meal, calcium carbonate, salt.

**Eastern States Milkmore Dairy Ration**

41% protein cottonseed meal, prime quality, distillers' corn dried grains, corn gluten feed, wheat bran (may contain mill run wheat screenings), 41% protein soybean oil meal, E. S. yellow corn feed meal, E. S. ground oats, cane molasses, 37% protein old process linseed meal, dicalcium phosphate, salt.

**Eastern States Producer 20 (Mash or Pelleted)**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), wheat flour middlings, 50% protein meat scraps, E. S. ground oats, alfalfa leaf meal, 58% protein fish meal, 41% protein soybean oil meal, dried skimmed milk, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Eastern States Producer (Mash or Pelleted)**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), wheat flour middlings, E. S. ground oats, 50% protein meat scraps, 58% protein fish meal, alfalfa leaf meal, dried skimmed milk, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Eastern States Sixteen Dairy Ration**

E. S. yellow corn feed meal, wheat bran (may contain mill run wheat screenings), E. S. ground oats, distillers' corn dried grains, cane molasses, corn gluten feed, E. S. ground barley, 41% protein cottonseed meal, prime quality, 37% protein old process linseed meal, 41% protein soybean oil meal, dicalcium phosphate, salt.

**Eastern States Starting and Broiler Ration (Mash or Pelleted)**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), wheat flour middlings, ground oat groats, dried skimmed milk, alfalfa leaf meal, 50% protein meat scraps, 58% protein fish meal, oyster shell meal, salt, sardine oil, dicalcium phosphate.

**Eastern States 32% Supplement Feed**

41% protein cottonseed meal, prime quality, 41% protein soybean oil meal, distillers' corn dried grains, corn gluten meal, 37% protein old process linseed meal, cane molasses, wheat bran (may contain mill run wheat screenings), dicalcium phosphate, salt.



**Eastern States Turkey Breeder (Mash or Pelleted)**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), 50 % protein meat scraps, wheat flour middlings, dried skimmed milk, alfalfa leaf meal, 41 % protein soybean oil meal, E. S. ground oats, 58 % protein fish meal, corn gluten meal, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Eastern States Turkey-Fat (Mash or Pelleted)**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), wheat flour middlings, 50 % protein meat scraps, E. S. ground oats, 41 % protein soybean oil meal, alfalfa leaf meal, corn gluten meal, dried skimmed milk, ground oat groats, oyster shell meal, salt.

**Eastern States Turkey-Grow (Mash or Pelleted)**

Wheat bran (may contain mill run wheat screenings), wheat flour middlings, 41 % protein soybean oil meal, 58 % protein fish meal, ground oat groats, alfalfa leaf meal, dried skimmed milk, corn gluten meal, E. S. ground oats, 50 % protein meat scraps, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Eastern States Turkey-Start**

E. S. yellow corn meal, wheat bran (may contain mill run wheat screenings), wheat flour middlings, 41 % protein soybean oil meal, 58 % protein fish meal, ground oat groats, corn gluten meal, alfalfa leaf meal, 50 % protein meat scraps, dried skimmed milk, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Economy Grocery Stores, Corp.****Countryside Egg Mash**

Vitamin tested cod liver oil, dried buttermilk, alfalfa leaf meal, corn meal, ground barley standard wheat bran and wheat middlings, fish meal, meat scraps, linseed oil meal, gluten meal, soy bean meal, calcium carbonate, and salt.

**Michael W. Ellis****The Ellis Dairy Feed**

Corn meal, wheat middlings, wheat bran, gluten meal, hominy feed, gluten feed, corn distillers grains, cottonseed meal, oil meal, ground oats, calcite flour, salt, edible bone meal. (Wheat feeds may contain screenings not exceeding mill run.)

**The Ellis Poultry Mash**

Wheat bran, wheat middlings, hominy feed, gluten feed, corn meal, rolled oats or feeding oatmeal, alfalfa leaf meal, cod liver oil, beef scraps, dried skim milk or buttermilk, edible bone meal, salt, charcoal, calcite flour. (Wheat feeds may contain screenings not exceeding mill run.)

**Elmore Milling Co., Inc.****Elmore Chixsaver**

Dried skim milk, wheat flour middlings, wheat bran, corn meal, alfalfa leaf meal, oat flour, meat and bone meal, fish meal, cod liver oil, oyster shell flour, fine table salt.

**Elmore Complete Broiler Ration**

Yellow corn meal, wheat bran, wheat middlings, oat meal flour, meat and bone meal, dried buttermilk, alfalfa leaf meal, fish meal, soybean meal, cod liver oil, oyster shell flour, salt.

**Elmore Complete Laying Ration**

Meat and bone meal, fish meal, whole oat groats, corn meal, ground wheat, alfalfa leaf meal, wheat bran, wheat middlings, dried skim milk, cod liver oil, calcium carbonate, salt.

**Elmore Egg Mash**

Dried skim milk, meat meal, second clear wheat flour, pure ground oats, wheat middlings, corn meal (No. 2 yellow), wheat bran, alfalfa leaf meal, fish meal, bone meal, cod liver oil, oyster shell flour, salt.

**Elmore M. A. C. Laying Mash**

Alfalfa leaf meal, wheat bran, corn meal, fish meal, wheat middlings, dried skim milk, ground heavy oats, meat scraps, oyster shell flour, cod liver oil, salt.

**Elmore Milk Grains**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, soybean oil meal, calcium carbonate and salt.

**Elmore Milk Grains Junior 20 %**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, soybean oil meal, calcium carbonate, salt.

**Elmore Milk Grains Junior Sweet**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, soybean oil meal, molasses, calcium carbonate, salt.

**Elmore's Sweet Digesto Dairy Feed**

Corn gluten feed, cotton seed meal, wheat bran, coconut oil meal, pulverized wheat screenings, oat meal mill by-products (oat hulls, oat midds and oat shorts), cane molasses, salt.

**Emco Feed**

Wheat bran, wheat midds, linseed oil meal, beet pulp, corn gluten feed, corn meal or hominy feed, cotton seed meal calcium carbonate, salt.

**Granger 20% Dairy Ration**

Wheat bran, wheat midds, ground barley, cottonseed meal, corn gluten feed, corn meal or hominy feed, soybean meal, cane molasses, reground wheat screenings, ground oats, dried brewers' grains, copra oil meal, calcium carbonate, salt.

**Waldorf 20% Ration**

Wheat bran, copra oil meal, corn gluten feed, soybean oil meal, cotton seed meal, cane molasses, pure ground oats, reground wheat screenings, calcium carbonate, salt.

**John W. Eshelman & Sons****Eshelman Challenge Dairy Feed**

Cottonseed meal, wheat bran, corn gluten feed, cane molasses, corn gluten meal, ground oats, brewers' dried grains, corn distillers' dried grains, corn meal, o. p. oil meal, soybean oil meal, reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Conestoga 20 Dairy Feed**

Cottonseed meal, wheat bran, cane molasses, corn gluten feed, brewers' dried grains, corn distillers' dried grains, soybean oil meal, o. p. oil meal, reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Lancaster 20 Dairy Feed**

Wheat bran, cottonseed meal, ground oats, corn gluten feed, cane molasses, brewers' dried grains, corn distillers' dried grains, corn meal, o. p. oil meal, soybean oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman 32% Mixing Ration**

Cottonseed meal, corn gluten meal, corn gluten feed, wheat bran, cane molasses, o. p. oil meal, soybean oil meal, corn distillers' dried grains, brewers' dried grains, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Pennsy 16 Dairy Feed**

Wheat bran, cottonseed meal, cane molasses, corn gluten feed, brewers' dried grains, o. p. oil meal, soybean oil meal, reground grain screenings from wheat, oat mill feed (oat midds, oat hulls, oat shorts), 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Pennsy Laying Mash**

Corn meal, wheat middlings, meat scrap, wheat bran, ground oats, alfalfa meal, soybean oil meal, cane molasses, fish meal, corn gluten feed, o. p. oil meal, 1% calcium carbonate,  $\frac{1}{2}$ % salt.

**Eshelman Red Rose All Mash Starter**

Corn meal, wheat bran, wheat middlings, pure oat meal, meat scrap, fish meal, soybean oil meal, alfalfa meal, dried buttermilk, o. p. oil meal, 2% calcium carbonate,  $1\frac{1}{4}$ % bone meal,  $\frac{1}{2}$ % salt,  $\frac{1}{2}$ % fortified cod liver oil.

**Eshelman Red Rose 24 Dairy Feed**

Cottonseed meal, wheat bran, corn gluten feed, cane molasses, corn gluten meal, ground oats, brewers' dried grains, corn distillers' dried grains, corn meal, o. p. oil meal, soybean oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Red Rose Growing Mash**

Wheat middlings, corn meal, wheat bran, meat scrap, pulverized oats, corn gluten feed, oat meal, soybean oil meal, hominy feed, o. p. oil meal, fish meal, dried buttermilk, fine alfalfa meal, 1% calcium carbonate,  $\frac{1}{2}$ % salt,  $\frac{1}{4}$ % fortified cod liver oil.

**Eshelman Red Rose Laying Mash**

Wheat middlings, corn meal, meat scrap, wheat bran, corn gluten feed, ground oats, o. p. oil meal, fish meal, soybean oil meal, hominy feed, fine alfalfa meal, dried buttermilk, 1% calcium carbonate,  $\frac{1}{2}$ % salt,  $\frac{1}{4}$ % fortified cod liver oil.

**Farm Service Stores, Inc.****C Dairy Feed**

Corn meal or hominy, cottonseed meal, oil meal or soybean meal, wheat bran (with wheat screenings), wheat midds (with wheat screenings), corn gluten feed, corn gluten meal, beet pulp, salt.

**C Growing Mash**

Corn meal or hominy, mixed feed, ground oats, meat scraps, dried milk, fish scraps, alfalfa meal, calcium carbonate, salt, cod liver oil.

**C Laying Mash**

Corn meal or hominy, mixed feed, corn gluten feed, oil meal or soybean meal, meat scraps, alfalfa meal, ground oats, bone meal, calcium carbonate, salt, fish meal.

**18% Dairy**

Corn meal or hominy, oil meal or soybean meal, cottonseed meal, corn gluten feed, dried grains, wheat bran with wheat screenings, ground grain screenings, oatmeal mill by-products, calcium carbonate, molasses, salt.

**Diamond A Dairy**

Corn meal or hominy, oil meal or soybean meal, corn gluten feed, wheat bran (with wheat screenings), dried grains, corn gluten meal, cottonseed meal, stock feed, salt, calcium carbonate.

**Diamond C Dairy**

Wheat bran (with wheat screenings), wheat midds (with wheat screenings), corn meal or hominy, cottonseed meal, oil meal or soybean meal, beet pulp, corn gluten feed, corn gluten meal, salt.

**Lawrence Cow Ration**

Wheat bran (with wheat screenings), corn meal or hominy, ground or pulverized oats, corn gluten feed, cottonseed meal, oil meal or soybean meal, dried grains, molasses, salt.

**New England Dairy Ration**

Corn gluten meal, corn gluten feed, wheat bran (with wheat screenings), corn meal or hominy, oil meal or soybean meal, cottonseed meal, ground oats, ground limestone, molasses, salt.

**North Star Chick Starter**

Wheat bran (with wheat screenings), flour midds (with ground screenings), corn meal or hominy, feeding oatmeal, meat scraps, fish meal, dried milk, alfalfa meal, calcium carbonate, salt, cod liver oil.

**North Star 24% Dairy Feed**

Corn meal or hominy, ground oats, soybean meal or oil meal, dried grains, wheat bran (with wheat screenings), gluten meal, gluten feed, cottonseed meal, molasses, calcium carbonate, bone meal, salt, ground barley.

**North Star 20% Dairy Feed**

Corn meal or hominy, soybean meal or oil meal, dried grains, ground grain screenings, wheat bran (with wheat screenings), corn gluten feed, cottonseed meal, molasses, calcium carbonate, bone meal, salt, beet pulp, corn gluten meal, oatmeal mill by-products.

**North Star 16% Dairy Feed**

Corn meal or hominy, soybean meal or oil meal, dried grains, wheat bran (with wheat screenings), corn gluten feed, cottonseed meal, molasses, calcium carbonate, bone meal, salt, ground grain screenings.

**North Star Growing Mash**

Corn meal or hominy, ground or pulverized oats, alfalfa meal, wheat midds (with wheat screenings), wheat bran (with wheat screenings), corn gluten feed, oil meal or soybean meal, calcium carbonate, meat scraps, bone meal, fish meal, salt, dried milk, with or without cod liver oil.

**North Star Laying Mash**

Corn meal or hominy, ground or pulverized oats, alfalfa meal, wheat midds (with wheat screenings), wheat bran (with wheat screenings), corn gluten feed, oil meal or soybean meal, calcium carbonate, meat scraps, fish meal, dried milk, salt, with or without cod liver oil.

**Service Egg Mash Complete**

Corn meal or hominy, ground or pulverized oats, wheat midds (with wheat screenings), wheat bran (with wheat screenings), corn gluten feed, oil meal or soybean meal, alfalfa meal, oat groats, ground barley, meat scraps, fish meal, dried milk, bone meal, calcium carbonate, salt, cod liver oil.

**First National Stores, Inc.****Henfield Egg Mash**

Hominy, corn meal, wheat middlings, wheat flour middlings, wheat bran, meat scraps, corn gluten feed, pulverized oats, old process linseed oil meal, fish meal, alfalfa meal, dried butter-milk, fortified cod liver oil, steamed bone meal, 1% calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**Flory Milling Co., Inc.****Flory's Blue Seal "All-Mash" Laying Mash**

Pure corn meal, meat scrap, alfalfa leaf meal, ground white oats, fish meal, oatmeal, dried skimmilk, soybean meal, milk sugar feed or dried whey (feeding), ground barley, ground wheat, wheat bran, standard wheat middlings, crab meal, tomato pulp, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's Dairy Feed**

Cottonseed meal, o. p. oil meal, ground white oats, cocoanut oil meal, soybean meal, corn gluten feed, corn gluten meal, dried malt grains, alfalfa meal, wheat bran (containing screenings not exceeding mill run), standard wheat middlings, buckwheat middlings, molasses, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's 24% Special Dairy Feed**

Cottonseed meal, corn gluten feed, ground white oats, corn gluten meal, wheat bran (containing screenings not exceeding mill run), cocoanut oil meal, o. p. oil meal, buckwheat middlings, malt grains, molasses, soybean meal, alfalfa meal, corn meal, standard middlings, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's 20% Special Dairy Feed**

Cottonseed meal, gluten meal, gluten feed, corn meal, buckwheat middlings, alfalfa meal, ground oats, cocoanut oil meal, o. p. oil meal, molasses, malt grains, wheat bran (containing screenings not exceeding mill run), essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's Growing Mash**

Yellow corn meal, dried skimmilk, milk sugar feed or dried whey (feeding), choice alfalfa meal, dried tomato pulp, ground white oats, ground barley, standard wheat middlings, wheat bran, corn gluten meal, meat scrap, fish meal, crab meal, soybean meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

**Flory's 32% Protein Supplement Mash**

Fish meal, soybean oil meal, meat scrap, milk sugar feed or dried whey (feeding), corn gluten meal, standard wheat middlings, wheat bran, cocoanut oil meal, crab meal, alfalfa leaf meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

**Golden Egg Laying Mash**

Dried buttermilk, meat scrap, fish meal, crab meal, dried tomato pulp, soybean meal, yellow corn meal, wheat flour middlings, ground barley, wheat bran, ground white oats, choice alfalfa meal, corn gluten meal, milk sugar feed or dried whey (feeding), buckwheat middlings, coconut oil meal, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Record Dairy Feed**

O. p. oil meal, cottonseed meal, soybean meal, corn gluten feed, buckwheat middlings, standard wheat middlings, corn meal, wheat bran (containing screenings not exceeding mill run), dried malt grains, ground oats, molasses, alfalfa meal, coconut oil meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Sunray Laying Mash**

Milk sugar feed or dried whey (feeding), soybean meal, meat scrap, alfalfa meal, wheat bran, standard wheat middlings, buckwheat middlings, ground oats, ground barley, corn meal, hominy, coconut oil meal, crab meal, fish meal, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

Fred A. Fountain

**Fountain's Buttermilk Growing Feed**

Dry buttermilk or dry skim milk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, table salt.

**Fountain's Buttermilk Laying Mash**

Dry buttermilk or dry skim milk, beef scrap, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, fish meal, table salt.

**Fountain's Buttermilk Starting Feed**

Dry buttermilk or dry skim milk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, calcium carbonate, table salt.

Dean S. French

**Special Mash or Poultry Feed**

Wheat feed, corn meal, gluten, alfalfa meal, linseed meal, meat scraps, ground oats, charcoal, salt, cod liver oil, ground bone.

Paul Fuller & Sons

**Eggmaker**

Dried skim milk, soy bean meal, alfalfa leaf meal, fine ground oats, feeding oat meal, st. wheat bran, fish meal, red dog flour, meat scraps, corn meal, gluten, salt, calcium carbonate.

J. B. Garland & Son

**Garland's Economy 20% Dairy Ration**

Bran, middlings, hominy, meal, cottonseed meal, gluten feed, oil meal, ground barley, dried brewers grains, soybean meal, distillers grains, coconut oil meal, malt sprouts, bone meal, calcium carbonate, salt and molasses.

**Garland's Economy Egg Mash**

Wheat bran, middlings, corn meal, hominy, soybean meal, gluten meal, pulverized oats, dried milk, ground barley, meat scraps, ground alfalfa, bone meal, calcium carbonate, salt and cod liver oil.

**Garland's Economy Growing Mash**

Wheat bran, middlings, corn meal, red dog, hominy, ground barley, copra meal, soybean meal, alfalfa meal, dried milk, meat scraps, fish meal, bone meal, calcium carbonate, salt and cod liver oil.

**Garland's Growing Mash**

Corn meal, hominy, wheat bran, middlings, red dog flour, calf meal, pulverized oats, ground barley, alfalfa leaf meal, soybean meal, dried milk, meat scraps, fish meal, bone meal, calcium carbonate and salt, (with or without cod liver oil), (with or without molasses).

**Garland's Laying Mash**

Wheat bran, middlings, corn meal, gluten meal, oat meal, alfalfa, ground barley, soybean meal, meat scraps, fish meal, dried milk, bone meal, calcium carbonate and salt, (with or without cod liver oil), (with or without molasses).

**Garland's 24% Ration**

Wheat bran, middlings, corn meal, hominy, gluten feed, oil meal, cottonseed meal, soybean meal, coconut oil meal, ground oats, brewers grains, distillers grains, bone meal, calcium carbonate, salt and molasses.

**Royal Worcester Complete Ration**

Gluten feed, oil meal, ground oats, wheat bran, middlings, corn meal, cottonseed meal, soybean meal, distillers grains, beet pulp, bone meal, calcium carbonate, salt and molasses.

General Mills, Inc.

**Eventually Gold Medal Chick Ration**

Wheat bran, wheat standard middlings, yellow corn meal, ground oat groats, alfalfa meal, meat and bone scraps, dried skimmilk, dried buttermilk, ground limestone  $2\frac{1}{4}\%$ , salt  $\frac{1}{2}\%$ , cold liver oil extract.

**Eventually Gold Medal Dairy Ration**

Wheat bran, wheat standard middlings, ground oats, yellow corn meal, corn gluten feed, cottonseed meal, linseed oil meal, ground limestone  $2\frac{3}{4}\%$ , salt  $\frac{1}{4}\%$ .

**Eventually Gold Medal Egg Mash**

Wheat bran, wheat standard middlings, yellow corn meal, ground oats, alfalfa meal, meat and bone scraps, dried skimmilk, dried buttermilk, ground limestone  $3\frac{1}{2}\%$ , salt  $1\frac{1}{2}\%$ , cod liver oil extract.

**Eventually Gold Medal Growing Mash**

Wheat bran, wheat standard middlings, yellow corn meal, ground oats, alfalfa meal, meat and bone scraps, dried skimmilk, dried buttermilk, ground limestone  $2\frac{1}{4}\%$ , salt  $\frac{3}{4}\%$ , cod liver oil extract.

W. K. Gilmore & Sons, Inc.

**Conference Mash**

Yellow corn meal, standard wheat bran, wheat flour middlings, pure ground oats, meat scraps  $50\%$ , pure fish meal  $55\%$ , alfalfa leaf meal, milk, calcite flour, cod liver oil, dicalcium phosphate, salt.

**Neponset Poultry Mash**

Wheat bran, wheat middlings, corn meal, ground oats, alfalfa, beef scraps, fish scraps, linseed oil meal, corn gluten feed, ground rolled oats, calcite flour, dried skim milk, fine salt.

Goode Grain Co.

**Goode Laying Mash. M.A.C. Formula.**

Corn meal, wheat bran, middlings, ground oats, meat scraps, dried skim or dried buttermilk, fish meal, alfalfa leaf meal, calcium carbonate, cod liver oil.

D. H. Grandin Milling Co.

**Grandin's Baby Chick Starter**

Dried buttermilk, fine ground hulled oats, ground wheat, corn meal, hominy feed, wheat middlings, alfalfa leaf meal, calcium carbonate, bone meal, one-half of one percent salt and cod liver oil.

**Grandin's Combined Chick and Broiler Ration**

Concentrated cod liver oil, dried buttermilk, ground meat and bone, fish meal, soybean oil, meal, alfalfa leaf meal, ground hulled oats, ground wheat, wheat bran, wheat middlings, pulverized oats, ground barley, hominy feed, yellow corn meal, calcium carbonate and salt.

**Grandin's 24% Balanced Dairy Ration**

Distillers dried grains, cottonseed meal, coconut oil meal, linseed oil meal, corn gluten feed, wheat bran, wheat middlings, hominy feed, steamed bone meal, calcium carbonate and salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Grandin's Sweetened 24% Dairy Feed**

Cane molasses, cottonseed meal, soybean oil meal, linseed oil meal, corn gluten meal, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), corn meal, corn feed meal, hominy feed, steamed bone meal, calcium carbonate and salt.

**Grandin's Sweetened 20% Dairy Feed**

Cane molasses, cottonseed meal, soybean oil meal, linseed oil meal, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), corn meal, corn feed meal, hominy feed, steamed bone meal, calcium carbonate and salt.

**Grandin's Growing Mash**

Dried buttermilk, ground meat and bone, fish meal, soybean oil meal, corn gluten feed, alfalfa meal, corn meal, corn feed meal, hominy feed, pulverized oats, ground barley, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), calcium carbonate and salt.

**Grandin's Laying Mash**

Dried buttermilk, ground meat and bone, fish meal, soybean oil meal, corn gluten meal, corn gluten feed, corn meal, corn feed meal, hominy feed, alfalfa meal, pulverized oats, ground barley, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), calcium carbonate and salt.

**Grandin's Complete Laying Ration**

Concentrated cod liver oil, dried buttermilk, ground meat and bone, fish meal, soybean oil meal, corn gluten meal, alfalfa meal, ground yellow corn, hominy feed, ground wheat, pulverized oats, ground barley, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), calcium carbonate and salt.

**Grandin's Milk Maker**

Dried beet pulp, cottonseed meal, soybean oil meal, linseed oil meal, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), corn meal, corn feed meal, hominy feed, steamed bone meal, calcium carbonate and salt.

**Grandin's Start-To-Finish Mash**

Concentrated cod liver oil, dried buttermilk, ground meat and bone, fish meal, soybean oil meal, corn gluten feed, alfalfa leaf meal, yellow corn meal, hominy feed, pulverized oats, ground barley, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), calcium carbonate and salt.

**Grandin's Complete Starting Ration**

Concentrated cod liver oil, dried buttermilk, ground meat and bone, fish meal, soybean oil meal, alfalfa leaf meal, ground hulled oats, hominy feed, ground yellow corn, ground wheat, pulverized oats, ground barley, wheat bran, wheat middlings, calcium carbonate and salt.



**Grandin's Twin Six Dairy Feed**

Cottonseed meal, soybean oil meal, linseed oil meal, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), corn meal, corn feed meal, hominy feed, alfalfa meal, steamed bone meal, calcium carbonate and salt.

**M-S (Money Saver) 24% Sweetened Dairy Feed**

Cane molasses, cottonseed meal, soybean oil meal, linseed oil meal, corn gluten meal, corn gluten feed, distillers' corn dried grains, brewers' dried grains, wheat bran, wheat middlings, ground grain screenings from corn, wheat, oats and barley, oat mill feed (oats hull, oat shorts, oat middlings), steamed bone meal, calcium carbonate and salt.

**M-S (Money Saver) 20% Sweetened Dairy Feed**

Cane molasses, cottonseed meal, soybean oil meal, linseed oil meal, corn gluten feed, distillers' corn dried grains, brewers' dried grains, wheat bran, wheat middlings, ground grain screenings from corn, wheat, oats and barley, oat mill feed (oat hulls, oat shorts, oat middlings), steamed bone meal, calcium carbonate and salt.

**Great Atlantic & Pacific Tea Co.****Daily Growth Chick Starter**

Dried buttermilk, dried skimmed milk, meat and bone scrap, wheat flour, wheat standard middlings, ground corn, corn feed meal, ground oats, ground oat groats, old process linseed oil meal, alfalfa meal, cod liver oil, calcium carbonate from limestone 1%, salt  $\frac{1}{2}$  of 1%, steamed bone meal  $\frac{1}{2}$  of 1%.

**Daily Egg Laying Mash Feed**

Ground oats, ground barley, soybean oil meal, old process linseed oil meal, corn gluten meal, wheat standard middlings, wheat bran, alfalfa meal, corn feed meal, dried buttermilk, dried skim milk, meat and bone scrap, fish meal, flour middlings, cod liver oil, cod liver meal, calcium carbonate from limestone  $2\frac{1}{2}\%$ , steamed bone meal  $1\frac{1}{2}\%$ , salt  $\frac{1}{2}$  of 1%, red iron oxide .02%, and .0015% potassium iodide.

**Daily Growth Growing Mash**

Meat and bone scrap, dried buttermilk, dried skimmed milk, wheat bran, alfalfa meal, wheat standard middlings, corn feed meal, ground oats, ground barley, old process linseed oil meal, corn gluten feed, cod liver oil, calcium carbonate from limestone 1%, steamed bone meal  $\frac{1}{2}\%$ , salt  $\frac{1}{2}$  of 1%.

**Milky Way Dairy Feed 24%**

Corn feed meal, dried grains from barley, malt and corn, wheat bran, cottonseed meal, wheat standard middlings, ground oats, ground barley, molasses, old process linseed oil meal, corn gluten meal, corn gluten feed, calcium carbonate from limestone 1%, salt 1%, malt sprouts, soybean oil meal.

**Milky Way Dairy Feed 20%**

Corn feed meal, dried grains from barley, malt and corn, wheat bran, cottonseed meal, wheat standard middlings, ground oats, ground barley, molasses, soybean oil meal, old process linseed oil meal, corn gluten meal, calcium carbonate from limestone 1%, salt 1%, malt sprouts, corn gluten feed.

**Great Eastern Feed Mills****"Phoenix" 24 Dairy Ration**

Soya bean oil meal, cottonseed oil meal, corn distillers grains, corn meal or hominy, flour middlings, "Wilpaco" white fishmeal, calcium carbonate, dairy salt, o. p. linseed oil meal, dried brewers grains, corn gluten feed, wheat bran, ground oats, pure cane molasses, calcium phosphate, cod liver oil.

**"Phoenix" 20 Dairy Ration**

Corn meal or hominy, wheat bran, flour middlings, corn gluten feed, corn distillers grains, brewers grains, soya bean oil meal, o. p. linseed oil meal, cottonseed oil meal, "Wilpaco" white fishmeal, ground oats, pure cane molasses, calcium carbonate, calcium phosphate, dairy salt, cod liver oil.

**"Phoenix" 16% Growing Mash**

Yellow corn meal, ground wheat, wheat bran, flour middlings, ground oats, "Wilpaco" white fishmeal, "Phoenix" crab meal, "Wilpaco" cooked meat and bone, alfalfa leaf meal, dry skim milk, salt, fortified cod liver oil.

**"Phoenix" 20% Laying Mash**

Yellow corn meal, wheat bran, ground oats, ground wheat, "Wilpaco" white fishmeal, "Phoenix" crab meal, "Wilpaco" cooked meat and bone, alfalfa leaf meal, soya bean oil meal, wheat flour middlings, dry skim milk, calcium carbonate, calcium phosphate, fortified cod liver oil, salt.

**Sugared "Phoenix" Feed**

Yellow corn meal, hominy feed, soya bean oil meal, barley meal, low grade flour, wheat middlings, oat mill feed (oat hulls, oat shorts, oat middlings), "Wilpaco" white fishmeal, pure cane molasses, calcium carbonate, calcium phosphate, dairy salt.

**"Wamesit" 18% Laying Mash**

Yellow corn meal, wheat bran, wheat middlings, ground oats, alfalfa leaf meal, "Wilpaco" cooked meat and bone, "Wilpaco" white fishmeal, "Phoenix" crab meal, soya bean oil meal, dry skim milk, cod liver oil, calcium carbonate, calcium phosphate, salt.

**D. Harbeck****Welcome Dairy Feed**

Bran, beet pulp, cottonseed meal, corn gluten meal, ground oats, hominy or corn feed meal, oil meal, middlings, steamed bone meal 1%, salt 1%.

**Welcome Growing Mash**

Corn meal, bran, flour middlings, ground oats, alfalfa leaf meal, meat scraps, fish meal, dried buttermilk or skim milk, ground barley, hominy feed, oil meal, ground wheat, bone meal, shell flour, salt, cod liver oil.

**Welcome Laying Mash**

Corn meal, wheat bran, flour middlings, ground oats, meat scraps, fish meal, alfalfa leaf meal, dried skim milk or dried buttermilk, salt, shell flour, cod liver oil.

**Welcome Starter & Broiler Ration**

Corn meal, bran, flour middlings, ground oat groats or feeding oatmeal, dried skim milk or dried buttermilk, alfalfa leaf meal, meat scraps, fish meal, shell flour, salt, cod liver oil.

**D. B. Hodgkins' Sons****Hodgkins' Dairy Ration**

Wheat bran, hominy, ground oats, corn gluten feed, corn meal, cottonseed meal, soy bean meal, linseed meal, beet pulp, brewers grains, molasses, calcium carbonate and salt.

**Hodgkins' Milk Ration**

Wheat bran, corn gluten feed, cottonseed meal, linseed meal, soy bean meal, oat feed, corn meal, hominy meal, brewers grain, beet pulp, molasses, bone meal, ground limestone and salt.

**Hodgkins' Poultry**

Ground corn, oats, middlings and bran (with screenings not to exceed mill run), corn gluten feed, linseed meal, ground meat scraps, calcium carbonate, dried skim milk or dried buttermilk, dairy salt, fish meal, alfalfa leaf meal and cod liver oil.

**Horvitz Grain Co.****Make-M-Lay Laying Mash**

Wheat bran, corn meal, gluten feed and gluten meal, ground oats, ground barley, red dog, wheat middlings, linseed meal, meat scraps, calcium carbonate, charcoal.

**Wantmore Dairy Ration**

Hominy feed or corn meal, wheat bran, ground oats, gluten feed and gluten meal, linseed meal, cottonseed meal, wheat middlings, calcium carbonate, salt.

**Wantmore Dairy with Beet Pulp**

Hominy feed or corn meal, wheat bran, gluten feed and gluten meal, linseed meal, cottonseed meal, wheat middlings, salt, beet pulp, ground oats, calcium carbonate.

**Wantmore Sweetened Special Dairy 24%**

Soy bean oil meal, cottonseed meal, oat meal mill by-products (oat middlings, oat shorts and oat hulls), wheat middlings, wheat bran, pure cane molasses, distillers' dried grains, corn gluten feed, calcium carbonate and dairy salt.

**Wantmore Sweetened Special Dairy 20%**

Soy bean oil meal, cottonseed meal, oat meal mill by-products (oat middlings, oat shorts and oat hulls), wheat middlings, wheat bran, pure cane molasses, distillers' dried grains, corn gluten feed, hominy feed, calcium carbonate and dairy salt.

**Jaquith & Co.****Dairy Ration**

Wheat bran and middlings, cottonseed meal, oil meal, soya bean meal, salt, gluten feed, alfalfa, ground oats and corn, dried grains, molasses.

**Growing Mash**

Ground corn, wheat and oats, soy bean meal, meat and bone meal, salt, buttermilk, alfalfa meal, cod liver oil, oil meal, shell meal.

**Laying Mash**

Ground oats, wheat and corn, gluten feed, oil meal, meat scraps, buttermilk, soya bean meal, salt, alfalfa meal, cod liver meal.

**Starting Feed**

Ground corn, oats and wheat, alfalfa meal, buttermilk, salt, shell meal, fish and meat meal, cod liver oil.

**Jersee Co.****Just Right Chick Starter**

Flour middlings, corn meal, wheat bran, oatmeal (feeding), dried skim milk, alfalfa leaf meal, fish meal, meat scraps, oyster shell meal, salt, calcium phosphate, cod liver oil.

**Just Right Dairy Ration 24%**

Old process linseed oil meal, choice cottonseed meal, choice yellow hominy, corn gluten feed, pure wheat bran, Diamond gluten meal, pure ground oats or pure crushed oats, 1% calcium phosphate, 1% salt.

**Just Right Dairy Ration 16%**

Old process linseed oil meal, choice cottonseed meal, choice yellow hominy, corn gluten feed, pure wheat bran, Diamond gluten meal, ground barley, pure ground oats, or crushed barley, crushed oats, 1% calcium phosphate, 1% salt.

**Just Right Egg Mash**

Standard middlings, standard bran, corn meal, corn gluten feed, fine ground oats, meat scraps, fish meal, calcium carbonate, limestone, alfalfa leaf meal, powdered whole and skim milk, St. John's bread, starch, milk sugar, wheat, red dog, oxide iron, di-calcium phosphate, anise, dried blood, iodized salt, yeast, cod liver oil.

**Just Right Growing Mash**

Powdered whole and skim milk, wheat middlings, oxide iron, calcium phosphate, corn meal, bone meal, anise, dried blood, salt, starch, St. John's bread, sugar, meat scraps, feeding oat meal, alfalfa leaf meal, fish meal, and Nopco XX cod liver oil.

Kasco Mills, Inc.

**Apex Complete Grower**

Corn meal, pulverized oats, ground barley, wheat bran, wheat middlings, soy bean oil meal, linseed oil meal, alfalfa meal, meat scrap, fish meal, bone meal, dried skim milk, milk sugar feed,  $\frac{1}{2}$  of 1% salt, calcite, tested cod liver oil.

**Apex Laying Mash**

Wheat bran, wheat middlings, corn meal, linseed oil meal, soy bean oil meal, pulverized oats, ground barley, meat scrap, bone meal, fish meal, dried skim milk, milk sugar feed,  $\frac{3}{4}$  of 1% salt, calcite, tested cod liver oil, alfalfa meal.

**Beatsall Milk Grains**

Wheat bran, wheat middlings, linseed oil meal, corn distillers grains, corn gluten feed, corn gluten meal, cottonseed meal, soy bean oil meal, hominy feed,  $\frac{3}{4}$  of 1% salt, 1% calcite, beet pulp, molasses.

**"K" Laying Mash**

Wheat bran, wheat middlings, corn meal, soy bean oil meal, pulverized oats, ground barley, meat scrap, bone, fish meal,  $\frac{3}{4}$  of 1% salt, calcite, alfalfa meal.

**Kasco All Mash Chick Food**

Wheat reddog, oatmeal, wheat middlings, wheat bran, corn meal, meat scrap, fish meal, bone meal, linseed oil meal, dried skim milk, milk sugar feed,  $\frac{1}{2}$  of 1% salt, tested cod liver oil, calcite, alfalfa leaf meal.

**Kasco All Mash Laying Food**

Corn meal, pulverized oats, oat meal, wheat bran, wheat middlings, wheat reddog, linseed oil meal, soy bean oil meal, ground barley, meat scrap, bone meal, fish meal, dried skim milk, milk sugar feed,  $\frac{1}{2}$  of 1% salt, calcite, tested cod liver oil, alfalfa meal.

**Kasco Poultry Flushing Mash**

Wheat reddog, oatmeal, wheat middlings, wheat bran, corn meal, meat scrap, fish meal, bone meal, linseed oil meal, milk sugar feed,  $\frac{1}{2}$  of 1% salt, tested cod liver oil, calcite, alfalfa leaf meal.

Larowe Milling Co.

**Larro — The Ready Ration for Dairy Cows**

Cottonseed meal, yellow corn meal, wheat standard middlings, soybean oil meal, o. p. linseed oil meal, corn gluten feed, dried beet pulp, wheat bran,  $\frac{3}{4}$ % salt.

**Larro Chick Builder**

Wheat bran, yellow corn meal, wheat standard middlings, ground barley, meat and bone scraps, soybean oil meal, fish meal, alfalfa meal, dried skimmed milk, dried buttermilk, ground oats, cod liver oil extract,  $2\frac{1}{2}$ % limestone,  $\frac{1}{2}$ % salt.

**Larro Chick Starter**

Yellow corn meal, ground oats groats, wheat standard middlings, wheat bran, meat and bone scraps, dried buttermilk, dried skimmed milk, alfalfa meal, cod liver oil extract,  $1\frac{3}{4}$ % limestone,  $\frac{1}{2}$ % salt.

**Larro Egg Mash (or Pellets)**

Wheat bran, yellow corn meal, wheat standard middlings, ground barley, meat and bone scraps, soybean oil meal, fish meal, alfalfa meal, dried skimmed milk, dried buttermilk, ground oats, cod liver oil extract,  $2\frac{1}{2}$ % limestone,  $\frac{1}{2}$ % salt.

**Larro Growing Mash**

Yellow corn meal, wheat standard middlings, wheat bran, meat and bone scraps, alfalfa meal, ground oats, dried buttermilk, dried skimmed milk, soybean oil meal, cod liver oil extract, 2% limestone,  $\frac{1}{2}$ % salt.

**Larowe's 16 Dairy Feed**

Cottonseed meal, corn gluten feed, wheat standard middlings, o. p. linseed oil meal, yellow corn meal, dried beet pulp, wheat bran, 1% salt.

Mansfield Milling Co.

**"Mansfield" Chick Growing Feed**

Wheat bran, wheat middlings, corn meal, red dog flour, oatmeal, fish scraps, meat scraps, dried milk, charcoal, alfalfa meal, cod liver oil, calcium carbonate, salt, soy bean oil meal.

**"Mansfield" Cow Ration**

Wheat bran, wheat middlings, corn meal, gluten feed, gluten meal, ground barley, ground oats, linseed meal, cottonseed meal, salt, soy bean oil meal.

**"Mansfield" Dry Poultry Mash**

Wheat bran, wheat middlings, corn meal, red dog flour, gluten feed, meat scraps, dried milk, alfalfa meal, cod liver oil, calcium carbonate, salt.

Maritime Milling Co., Inc.

**B B Bull Brand All Mash Laying Ration**

Cod liver oil, milk sugar feed, dried buttermilk, alfalfa meal, wheat bran and wheat middlings with mill run ground screenings, ground wheat, soya bean oil meal, corn gluten meal, corn meal, pulverized oats, pulverized barley, ground oat meal, meat meal, fish meal, steamed bone meal, calcium carbonate, salt and potassium iodide.



**B B Bull Brand Laying Mash**

Milk sugar feed, dried buttermilk, alfalfa meal, wheat bran and wheat middlings with mill run ground screenings, soya bean oil meal, corn gluten meal, corn meal, pulverized oats, pulverized barley, ground oat meal, meat meal, fish meal, steamed bone meal, calcium carbonate, salt and potassium iodide.

**Sweetened B B Bull Brand "20" Dairy Ration**

Dried brewers grains, cotton seed meal, corn gluten feed, soya bean oil meal, o. p. linseed oil meal, hominy feed, corn meal, wheat bran and wheat middlings with mill run ground screenings, molasses, steamed bone meal, calcium carbonate, salt and potassium iodide.

**B B Hi-Test Dairy Feed 20% Pro. Sweetened**

Dried brewers grains, cotton seed meal, corn gluten feed, soya bean oil meal, hominy feed, ground oats, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

**B B Marmico 16% Protein Dairy Feed with Molasses**

Dried brewers grains, soya bean oil meal, cotton seed meal, corn gluten feed, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

Geo. Q. Moon & Co., Inc.

**U. S. 20% Dairy Ration**

Corn gluten feed, cottonseed meal, coconut oil meal, bran, corn meal, corn distillers grains, rye distillers grains, oat feed, molasses, calcium carbonate, bone meal, salt, soybean oil meal, malt sprouts.

Ogden Grain Co.

**24% Ograinco Milk Ration**

Corn distillers' dried grains, soybean oil meal, corn gluten feed, cotton seed meal, corn meal or hominy, wheat bran, ground wheat screenings, cane molasses, salt, calcium carbonate.

**Ograinco Milk Ration**

Corn distillers' dried grains, corn gluten feed, soybean oil meal, cotton seed meal, corn meal or hominy, wheat bran, ground wheat screenings, cane molasses, salt, calcium carbonate, o. p. linseed oil meal.

**Pilgrim All Purpose Complete Ration**

Alfalfa meal, pulverized oats, meat scraps, dried skim milk, fish meal, corn meal, wheat middlings, wheat flour middlings (may contain screenings not exceeding mill run), bone meal, cod liver oil, calcium carbonate, Kelco meal.

**Pilgrim Chick and Broiler Ration**

Alfalfa leaf meal, fish meal, meat meal, dried skimmilk, corn meal, wheat bran, wheat middlings, gluten meal, flour middlings, pulverized oats, soya bean oil meal, cod liver oil, potassium iodide, calcium carbonate, salt, "Vitadine".

**Pilgrim 16% Dairy Feed**

Corn gluten feed, hominy feed or corn meal, wheat bran, dried brewer's grains, ground wheat screenings, cane molasses, calcium carbonate, salt.

**Pilgrim Laying Mash**

Alfalfa leaf meal, pulverized oats, meat scraps, fish meal, dried skim milk, semi-solid buttermilk, gluten meal, soyabean oil meal, corn meal, wheat bran, wheat middlings, calcium carbonate, cod liver oil, Kelco meal.

**Pilgrim Special Laying Mash**

Alfalfa meal, pulverized oats, meat scraps, fish meal, dried skim milk, soyabean oil meal, corn meal, ground wheat, wheat bran, wheat middlings (may contain mill run screenings), salt, calcium carbonate, cod liver oil.

**Thrift 20% Dairy Feed**

Soybean oil meal, corn gluten feed, old process linseed oil meal, gluten meal, corn meal, low fibre ground oats, cottonseed meal, standard wheat bran, standard wheat middlings, ground wheat screenings, molasses, calcium carbonate and salt.

Park & Pollard Co.

**Bet-R-Milk 20% Ration**

Corn distillers grains, corn gluten feed, linseed oil meal, soybean meal, cottonseed meal, malt sprouts, wheat bran, wheat middlings, hominy feed, iodol fish meal, molasses, calcium carbonate and salt.

**Bidwell 24% Dairy Ration**

Wheat bran, linseed oil meal, soybean meal, ground barley, malt sprouts, corn gluten meal, cottonseed meal, corn gluten feed, fine ground wheat screenings, molasses, calcium carbonate and salt.

**Bidwell 20% Dairy Ration**

Wheat bran, linseed oil meal, malt sprouts, gluten feed, gluten meal, soybean meal, ground barley, cottonseed meal, fine ground wheat screenings, molasses, calcium carbonate and salt.

**Bidwell Dry-Mash**

Dried buttermilk, alfalfa meal, corn meal, wheat bran, wheat middlings, fish meal, meat, bone, linseed oil meal, gluten meal, soybean meal, calcium carbonate, salt and ground wheat, barley, kaffir corn and buckwheat, vitamin tested cod liver oil.

**Doublex 20% Dairy Ration**

Linseed oil meal, gluten feed, gluten meal, soybean meal, corn distillers grains, ground barley, wheat bran, malt sprouts, cottonseed meal, fine ground wheat screenings, molasses, calcium carbonate and salt.

**Growing Feed**

Dried buttermilk, alfalfa leaf meal, Iodol fish meal, linseed oil meal, meat and bone meal, wheat bran, wheat middlings, calcium carbonate, salt, ground corn, wheat, oats, barley, buckwheat, vitamin tested cod liver oil.

**Lay or Bust Dry-Mash**

Dried buttermilk, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soybean meal, wheat bran, wheat middlings, calcium carbonate, salt, ground corn, wheat, oats, barley, kafir corn, buckwheat, vitamin tested cod liver oil.

**Manamar 20% Dairy Ration**

Kelp, Pacific Coast fish meal and marine sea shells, corn distillers grains, linseed oil meal, soybean meal, malt sprouts, wheat bran, brewers dried grains, hominy feed, ground oats, molasses, calcium carbonate and salt.

**Manamar Doublex 20% Dairy Ration**

Kelp, Pacific Coast fish meal, marine sea shells, linseed oil meal, gluten feed, gluten meal, soybean meal, ground barley, corn distillers grains, wheat bran, malt sprouts, cottonseed meal, hominy, fine ground wheat screenings, molasses, calcium carbonate and salt.

**Manamar Lay or Bust Mash**

Kelp, Pacific Coast fish meal and marine sea shells, dried buttermilk, meat scraps, alfalfa leaf meal, pure wheat bran, wheat middlings, ground yellow corn, oats, wheat, barley, buckwheat, vitamin tested cod liver oil.

**Manamar Life Cycle Mash**

Kelp, Pacific Coast fish meal and marine sea shells, meat scraps, pure wheat bran, soybean meal, wheat middlings, alfalfa leaf meal, dried buttermilk, ground yellow corn, oats, wheat, barley, buckwheat, vitamin tested cod liver oil.

**Manamar Top Notch 16% Dairy Ration**

Kelp, Pacific Coast fish meal, marine sea shells, corn distillers grains, ground barley, malt sprouts, linseed oil meal, cottonseed meal, fine ground wheat screenings, molasses, calcium carbonate and salt.

**Park & Pollard Chick Starter**

Dried buttermilk, ground corn, wheat, barley, oat meal, Iodol fish meal, meat scrap, wheat bran, wheat middlings, alfalfa leaf meal, rice, calcium carbonate, salt, vitamin tested cod liver oil.

**Top Notch 16% Ration**

Corn distillers grains, ground barley, malt sprouts, linseed oil meal, cottonseed meal, fine ground wheat screenings, soybean meal, molasses, calcium carbonate and salt.

**Yankee Dairy Ration**

Corn gluten feed, cottonseed meal, wheat bran, wheat middlings, corn gluten meal, soybean meal, linseed oil meal, ground oats, corn meal, brewers grains, molasses, calcium carbonate and salt.

George H. Parker Grain Co.

**Parker's Egg Mash**

Yellow corn meal, wheat bran, wheat middlings, ground oats, dried skimmed milk, meat scraps, fish meal, alfalfa leaf meal, soy bean meal, edible bone meal, calcium carbonate, charcoal, vitamin tested cod liver oil and salt.

**Parker's Special Dairy Ration**

Wheat bran, yellow corn meal, hominy, old process linseed meal, soy bean meal, oat feed, corn gluten feed, cottonseed meal, molasses, calcium carbonate, steamed bone meal and salt.

Phaneuf & Son

**O Boy All Mash Starter**

Fish meal, soybean oil meal, meat scrap, milk sugar feed or dried whey (feeding), corn gluten meal, standard wheat middlings, wheat bran, coconut oil meal, dried tomato pulp, crab meal, alfalfa leaf meal, ground oat meal, ground yellow corn, charcoal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

**O Boy Egg Mash**

Ground yellow meal and ground oats, fish meal, soybean oil meal, meat scrap, milk sugar feed or dried whey (feeding), corn gluten meal, standard wheat middlings, wheat bran, coconut oil meal, dried tomato pulp, crab meal, alfalfa leaf meal, essential minerals (calcium carbonate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

**O Boy Grower**

Ground yellow meal and ground oats, fish meal, soybean oil meal, meat scrap, milk sugar feed or dried whey (feeding), corn gluten meal, standard wheat middlings, wheat bran, coconut oil meal, dried tomato pulp, crab meal, alfalfa leaf meal, essential minerals (calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

W. N. Potter Grain Stores, Inc.

**A.D.P. 24% Dairy Ration**

Ground corn, hominy, cotton seed meal, corn gluten meal, wheat bran, ground oats, oilmeal, calcium carbonate, bone meal, and salt.

**Potter's Sweetened Dairy Ration**

Gluten feed, hominy, linseed oilmeal, ground oats, wheat bran, std. wheat middlings, cotton seed meal, corn distillers grains, molasses, calcium carbonate, bone meal and salt.

**H. C. Puffer Co.****Egg-Em-On Growing Feed**

Corn feed meal, corn gluten feed, ground barley, feeding oatmeal, soy bean meal, wheat bran, wheat middlings, meat scraps, fish meal, dried milk, alfalfa meal, cod liver oil, salt, calcium carbonate.

**Egg-Em-On Laying Mash**

Dried milk, dried fish, meat scraps, wheat bran and wheat middlings, (not exceeding mill run of screenings), corn feed meal, corn gluten feed, feeding oatmeal, soy bean meal, linseed meal, alfalfa meal, cod liver oil, small percentage salt and calcium carbonate.

**Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, corn gluten meal, ground oats, corn feed meal or hominy meal, wheat bran and wheat middlings (not exceeding mill run of screenings), small percentage salt and calcium carbonate.

**Sweetened Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, soy bean meal, corn feed meal or hominy meal, wheat bran (not exceeding mill run of screenings), oat feed, molasses, small percentage salt and calcium carbonate.

**Quaker Oats Co.****Big Egg Laying Mash**

Hominy feed, yellow hominy feed, wheat bran, wheat standard middlings, ground oats, soybean oil meal, meat scraps, sardine oil, dried skimmed milk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Quaker 20% Protein Dairy Ration**

Hominy feed, yellow hominy feed, barley feed, cottonseed meal, corn gluten feed, soybean oil meal, wheat bran, wheat standard middlings, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% iodized ground limestone, 1% bone meal, molasses.

**Quaker 16% Protein Dairy Ration**

Hominy feed, yellow hominy feed, cottonseed meal, soybean oil meal, corn gluten feed, wheat bran, wheat standard middlings, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% iodized ground limestone, 1% bone meal, molasses, barley feed.

**Quaker Ful-O-Pep Egg Mash**

Oatmeal, hominy feed, yellow hominy feed, wheat bran, wheat standard middlings, barley meal, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Quaker Ful-O-Pep Growing Mash**

Oatmeal, yellow hominy feed, wheat bran, wheat standard middlings, barley meal, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Quaker Ful-O-Pep Station Grade Fattening Feed**

Oatmeal, rolled oats, hominy feed, yellow hominy feed, wheat standard middlings, low grade wheat flour, corn germ meal, ground puffed rice,  $\frac{3}{4}$  of 1% salt.

**Quaker Full-O-Pep Turkey Starter**

Oatmeal, ground yellow corn, yellow hominy feed, wheat bran, wheat standard middlings, corn gluten meal, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Ralston Purina Co.****Protena 24% Dairy Feed**

Linseed meal, soy bean oil meal, cottonseed meal, alfalfa meal, corn gluten feed, wheat middlings (standard), wheat bran, molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Protena 20% Dairy Feed**

Linseed meal, soy bean oil meal, cottonseed meal, corn gluten feed, wheat middlings (standard), alfalfa meal, wheat bran, ground grain screenings (from wheat, corn, oats, barley, kafir) molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Purina Milking Cow Chow (34%)**

Linseed meal, soy bean oil meal, corn gluten meal, cottonseed meal, alfalfa meal, molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Purina Milking Cow Chow (20%)**

Dried beet pulp, linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, distillers' corn dried grains, brewers' dried grains, wheat middlings (standard), wheat bran, corn meal, alfalfa meal, molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Purina Turkey Growing & Fattening Chow**

Pur-A-Tene (Carotene), meat scrap, soy bean oil meal, alfalfa meal, corn meal, wheat middlings (standard), wheat bran,  $\frac{1}{2}$ % iodized salt.

**D. F. Riley****Riley's Chick & Broiler Ration**

Corn meal, wheat bran, flour middlings, dried skim milk, beef scraps, oil meal, feeding oatmeal, ground limestone, alfalfa leaf meal, salt.

**Riley's Growing Mash**

Yellow corn meal, wheat bran, flour middlings, dried skim milk, oil meal, ground oats, ground lime stone, bone meal, cod liver oil.

**Riley's Laying Mash**

Wheat middlings, wheat bran, yellow corn meal, gluten feed, ground oats, beef scraps, fish meal, dried skim milk, o. p. oil meal, alfalfa leaf meal, calcium carbonate, salt, fortified cod liver oil.

**Riley's 20% Ration**

Gluten feed, wheat middlings, linseed oil meal, 41% cottonseed meal, wheat bran, dried brewer's grains, corn meal or hominy, bone meal, salt.

**Ryther & Warren****Blue Tag Dairy Ration**

41% Cottonseed meal, o. p. linseed oil meal, corn gluten feed, white hominy (or corn meal), standard bran, standard middlings, ground oats, dried beet pulp, calcium carbonate 1%, and salt  $\frac{1}{2}$  of 1%.

**Minot Chick Mash, Starting and Growing Feed**

Yellow corn meal, wheat bran, flour middlings, ground oat meal, meat scraps 50% pro., fish meal 55% pro., alfalfa leaf meal, shell meal, dried milk, salt, fortified cod liver oil.

**Minot Complete Laying Ration**

Corn meal, wheat bran, wheat middlings, ground oats, ground barley, alfalfa leaf meal, meat scraps, fish meal, dried milk, cod liver meal, shell meal and salt.

**Minot Milk Egg Mash**

Yellow corn meal, wheat bran, flour middlings, ground 40-lb. oats, meat scraps 50% pro., fish meal 55% pro., alfalfa leaf meal, shell meal, dried milk, salt, fortified cod liver oil.

**Minot Poultry Mash**

Wheat bran, wheat middlings, red dog middlings, corn meal, gluten feed, alfalfa meal, ground oats, meat scraps, fish meal, calcium carbonate and salt.

**Minot Special Dairy Ration**

Wheat bran, ground oats, gluten feed, 41% cottonseed meal, hominy feed (or corn meal), dried brewers grains, oil meal, rye feed, salt and lime.

**St. Albans Grain Co.****Hygrade 24 Sweetened Milk Ration**

Corn gluten meal, corn gluten feed, old process linseed meal, soybean oil meal, cottonseed meal, brewers' dried grains, corn meal, hominy feed, ground oats, ground barley, wheat bran, wheat middlings, calcium carbonate, dairy salt and pure cane molasses.

**Hygrade 20 Sweetened Milk Ration with or without Fortified Cod Liver Oil**

Fortified cod liver oil, old process linseed meal, soybean oil meal, cottonseed meal, brewers' dried grains, corn gluten meal, corn gluten feed, corn meal, hominy feed, ground oats, ground barley, wheat bran, wheat middlings, pure cane molasses, calcium carbonate and dairy salt.

**Utility 20 Dairy Ration**

Old process linseed meal, soybean oil meal, corn gluten feed, cottonseed meal, corn meal, hominy feed, ground oats, ground barley, brewers' dried grains, oat meal mill by-products (oat middlings, oat shorts, oat hulls), wheat bran, wheat middlings, calcium carbonate, pure cane molasses and dairy salt.

**Utility 16 Dairy Ration**

Old process linseed meal, corn gluten meal, corn gluten feed, choice cottonseed meal, yellow corn meal, hominy feed, ground oats, barley, brewers' dried grains, oat meal mill by-products (oat middlings, oat shorts, oat hulls), wheat bran, wheat middlings, calcium carbonate, pure cane molasses and dairy salt.

**Wirthmore Complete Chick Starter and Broiler Ration**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), ground oat groats, meat scraps, fish meal, alfalfa leaf meal, corn gluten meal, soybean oil meal, yellow corn meal, wheat bran, wheat middlings, calcium carbonate and salt.

**Wirthmore Complete Laying Ration**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, whole oat groats, ground yellow corn, ground oats, alfalfa leaf meal, ground wheat, wheat bran, wheat middlings, calcium carbonate and salt.

**Wirthmore 20 Dairy Feed Sweetened with or without Fortified Cod Liver Oil**

Fortified cod liver oil, corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, cottonseed meal, corn gluten feed, yellow corn meal, ground oats, ground barley, wheat middlings, wheat bran, edible bone meal, pure cane molasses and dairy salt.

**Wirthmore 16 Dairy Ration Sweetened with or without Fortified Cod Liver Oil**

Fortified cod liver oil, corn gluten meal, corn distillers' dried grains, corn gluten feed, old process linseed meal, soybean oil meal, yellow corn meal, hominy feed, ground oats, ground barley, wheat bran, wheat middlings, cottonseed meal, calcium carbonate, pure cane molasses, steamed bone meal and dairy salt.

**Wirthmore Growing Mash**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, alfalfa leaf meal, old process linseed meal, ground wheat, oats, barley, soybean oil meal, corn gluten meal, wheat bran, wheat middlings, wheat red dog, calcium carbonate and salt.

**Wirthmore Laying Mash**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, alfalfa meal, linseed meal, soybean oil meal, corn gluten meal, wheat bran, wheat middlings, ground wheat, oats, barley, buckwheat, calcium carbonate and salt.

**Wirthmore Fleshing Pellets**

Dried skim milk, meat scraps, soybean oil meal, corn germ meal, feeding oatmeal, wheat bran, wheat middlings, wheat red dog flour, yellow corn meal, alfalfa meal, calcium carbonate, salt, cod liver oil, molasses.

Mrs. Annie P. Smith

**Pentucket Laying Mash**

Corn meal, wheat bran, wheat flour midds, feeding oat meal, 50 % meat scraps, 52 % fish meal, alfalfa leaf meal, edible bone meal, charcoal, calcite flour, salt.

Smith, Bodfish, Swift Co.

**Paramount Laying Mash**

Alfalfa meal, beef scraps 60 %, bone meal, bran, calcium carbonate, hominy, corn meal, midds, cod liver oil, salt, ground oats.

C. H. Symmes & Co.

**The Ideal Dairy Ration**

Wheat middlings, wheat bran, brewers grains, cottonseed meal, linseed meal, gluten feed, corn meal or hominy, molasses, salt, bone meal, calcium carbonate, ground barley.

Syracuse Milling Co.

**Syragold Dairy Feed**

Corn meal, ground oats, wheat bran and wheat middlings with mill run screenings, toasted wheat feed (wheat and wheat bran processed), corn gluten feed, linseed meal, cottonseed meal, soy bean oil meal, distillers' dried grains, brewers' dried grains, calcium carbonate and salt.

Tloga Mills, Inc.

**E-Gee Dairy Feed**

Wheat bran, peanut oil meal, corn gluten feed, wheat middlings, cane molasses, salt, phosphate of lime, charcoal, potassium iodide, brewers dried grains, corn distillers grains, palm kernel oil meal, soybean oil meal, ground barley. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**Protena 16% Dairy Feed (Buffalo Mill)**

Linseed meal, soy bean oil meal, gluten feed, alfalfa meal, wheat middlings (standard), cottonseed meal, molasses, ground grain screenings (from wheat, corn, oats, barley, kafir), wheat bran, 2 % calcium carbonate (limestone), 1 % iodized salt.

**Purina Broiler Chow**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, alfalfa leaf meal, corn meal, ground oats, wheat middlings (standard), wheat bran, alfalfa meal, 1½ % calcium carbonate (limestone), ½ % iodized salt.

**Purina Chicken Fatena**

Ground oats, corn meal, ground barley, corn germ meal, wheat flour (second clear), grey wheat middlings, linseed meal, meat scrap, rolled oats, ½ % iodized salt.

**Purina Chick Growena**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, wheat germ, alfalfa meal, corn meal, beet pulp, grey wheat middlings, wheat bran, 1½ % calcium carbonate (limestone), ¼ % iodized salt.

**Purina Chick Startena**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, alfalfa leaf meal, wheat germ, linseed meal, corn germ meal, oat middlings, corn meal, wheat bran, grey wheat middlings, 1½ % calcium carbonate (limestone), ½ % iodized salt.

**Purina Egg Chowder**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, soy bean oil meal, linseed meal, alfalfa meal, corn germ meal, wheat middlings (standard), wheat bran, corn meal, 1 % iodized salt, 3 % calcium carbonate (limestone).

**Purina Lay Chow**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, soy bean oil meal, linseed meal, alfalfa meal, corn germ meal, wheat middlings (standard), wheat bran, corn meal, 1 % iodized salt, 3 % calcium carbonate (limestone).

**Purina Layena (Complete Ration)**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, soy bean oil meal, alfalfa meal, wheat middlings (standard), beet pulp, corn meal, ½ % iodized salt, 4 % calcium carbonate (limestone).

**Red Brand Tloga Dairy Feed**

Cocoonut oil meal, wheat bran, cottonseed meal, corn gluten feed, peanut oil meal, cane molasses, potassium iodide, salt, phosphate of lime, charcoal, soybean oil meal, brewers dried grains, corn distillers grains, palm kernel oil meal, wheat middlings. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)



**Tioga Laying Food**

Wheat middlings, corn meal, wheat bran, pulverized oats, fish meal, soybean oil meal, corn gluten meal, meat and bone scrap, dried skim milk, phosphate of lime, linseed oil meal, hominy feed, alfalfa leaf meal, calcium carbonate, salt. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run.)

**United Cooperative Farmers, Inc.****United Farmers Milk Egg Mash**

No. 2 yellow meal (Attrition), standard wheat bran, wheat flour midds, pure pulv. oats (No. 2, 38 lb. clipped — unsul.), meat scraps 50 %, fish meal 55 %, alfalfa leaf meal, dried buttermilk, bone meal, salt.

**United Farmers Milkmaker**

Choice yellow hominy, 38 lbs. ground oats, standard or pure bran, choice cottonseed 41 %, oil meal pure, corn gluten feed, soya bean meal, molasses, corn distillers' grains, steamed bone meal, calcium carbonate, salt.

**United Farmers Milk Pep**

Cottonseed 41 %, o. p. oil meal, yellow hominy, corn gluten feed, pure ground oats 38 lb., soybean meal, standard or pure bran, corn distillers' grains, bone meal, calcium carbonate, salt.

**United Farmers Starting & Growing Mash**

No. 2 yellow corn meal (Attrition), wheat flour middlings, standard wheat bran, ground oat groats, pure dried buttermilk, alfalfa leaf meal, steamed bone meal, pure fish meal 55 %, meat scraps 50 %, salt.

**Unity Feeds, Inc.****Unity Complete Starting & Broiler Mash**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, fish meal, meat scraps, ground wheat, ground barley, corn meal, ground oats, wheat bran, wheat middlings, calcium carbonate and salt.

**Unity Laying Mash**

Dried buttermilk, alfalfa leaf meal, soya bean meal, fish meal, meat scraps, linseed oil meal, wheat bran, wheat middlings, ground oats, ground wheat, corn meal, calcium carbonate and salt.

**Arthur Ventura Grain Co.****Ventura's Dairy Feed**

Bran, midds, hominy, Diamond gluten, soya bean meal, cotton seed meal, linseed meal, beet pulp, ground oats, calcite flour, bone meal, salt, gluten feed.

**Ventura's Laying Mash**

Bran, midds, meal, alfalfa meal, meat scraps, fish meal, milk, ground oats, ground barley, barley flour, second clear flour, calcite, salt, cod liver oil.

**Ventura's Starter & Grower**

Bran, midds, meal, alfalfa meal, meat scraps, fish meal, milk, feeding oat meal, ground oats, ground barley, second clear flour, salt, calcite flour, cod liver oil, charcoal, barley flour.

**C. P. Washburn Co.****Made-Right Balanced Ration**

Cottonseed meal, linseed oil meal, corn gluten, wheat bran, corn meal, oat feed, beet pulp, charcoal, calcium carbonate, salt, bone meal, ground oats, soya bean meal, brewers grain.

**Made-Right Complete Broiler Ration**

Fortified cod liver oil, dried milk, corn meal, bran, middlings, oat meal, high grade meat scraps, fish meal, ground wheat, soya bean meal, gluten, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, minerals, iron oxide, iodine.

**Made-Right Complete Layer**

Fortified cod liver oil, dried milk, corn meal, bran, middlings, oat meal, high grade meat scraps, fish meal, ground wheat, soya bean meal, gluten, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, minerals, iron oxide, iodine.

**Made-Right 16 % Dairy Feed**

Corn meal, wheat meal, ground oats, cottonseed meal, wheat bran, soya bean meal, gluten, molasses, bone meal, calcium carbonate, salt, brewers grains.

**Made-Right Dry Mash**

Corn meal, wheat bran, wheat middlings, red dog, 2nd clear flour, ground oat meal, linseed oil meal, gluten feed, soya bean meal, ground wheat, meat scraps, fish meal, dried milk, alfalfa leaf meal, molasses, charcoal, calcium carbonate, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

**Made-Right Starting and Growing Feed**

Corn meal, wheat bran, wheat middlings, oat meal, gluten meal, red dog, 2nd clear flour, meat scraps, ground wheat, soya bean meal, fish meal, dried milk, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

**Made-Right Sweet Dairy Feed**

Corn meal, wheat meal, ground oats, cottonseed meal, linseed oil meal, wheat bran, soya bean meal, gluten, molasses, bone meal, calcium carbonate, salt, brewers grains.

## Wayne County Grangers Feed Corp.

**Galen 24% Dairy Feed**

Corn distillers grains, corn gluten feed, brewers grains, choice cottonseed meal, wheat bran, (may contain screenings), soyabean oil meal, hominy feed and cornmeal, ground oats, cane molasses, malt sprouts, steamed bonemeal, ground limestone, salt.

**Superior Laying-Mash**

55% meat scrap, fish meal, buttermilk, fortified cod liver oil, corn meal, ground wheat, heavy ground oats, ground barley, red dog wheat flour, wheat bran (may contain screenings), corn gluten meal, soybean oil meal, alfalfa meal, essential minerals (iodine, salt, iron sulphate, calcium carbonate and bone charcoal).

## H. K. Webster Co.

**Blue Seal Breeders' Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground heavy oats, ground rolled oats, ground barley, corn gluten meal, 50% meat scraps, dried skim milk, 55% codfish meal, alfalfa leaf meal, salt, calcium carbonate, cod liver oil.

**Blue Seal College Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, fine ground heavy oats, 50% meat scraps, 55% codfish meal, alfalfa leaf meal, dried skim milk, calcium carbonate, salt, cod liver oil.

**Blue Seal "20" Dairy Ration**

Old process linseed oil meal, soy bean oil meal, ground oats, malt sprouts, gluten feed, choice cottonseed meal, hominy feed, wheat bran, corn distillers grains, brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, salt).

**Blue Seal Egg Mash**

Yellow corn meal, fine ground oats, pure wheat bran, pure wheat middlings, h. g. meat scraps, dried skim milk, alfalfa leaf meal, P. R. cane molasses, gluten meal, calcium carbonate, salt, cod liver oil.

**Blue Seal Growing Mash**

Dried skim milk, h. g. meat scraps, 55% fish meal, alfalfa leaf meal, gluten meal, No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground oats, ground barley, P. R. cane molasses, calcium carbonate, salt, cod liver oil.

**Blue Seal Hom-Mix 24% Dairy Ration**

Choice cottonseed meal, soy bean oil meal, malt sprouts, gluten meal, oat feed, wheat bran, hominy feed, peanut skins, germs and meal, linseed oil meal, dried brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, salt).

**Blue Seal Improved All-Mash Ration**

Coarse ground No. 2 yellow corn, ground fancy wheat, fine ground heavy oats, pure wheat bran, wheat flour middlings, h. g. meat scraps, 55% codfish meal, dried skim milk, alfalfa leaf meal, P. R. cane molasses, calcium carbonate, salt, cod liver oil.

**Blue Seal Improved Balanced Ration**

Old process linseed oil meal, soy bean oil meal, ground oats, malt sprouts, gluten meal, choice cottonseed meal, hominy feed, wheat bran, corn distillers grains, dried brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, salt).

**Blue Seal Laying Mash**

No. 2 yellow corn meal, pure wheat bran, fine ground heavy oats, h. g. meat scraps, corn gluten meal, wheat flour middlings, ground barley, ground fancy wheat, P. R. cane molasses, alfalfa leaf meal, dried skim milk, 55% codfish meal, salt, calcium carbonate, cod liver oil.

**Blue Seal Special 20% Dairy Ration**

Choice cottonseed meal, soy bean oil meal, malt sprouts, gluten feed, oat feed, wheat bran, hominy feed, peanut skins, germs and meal, linseed oil meal, dried brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, salt).

## West-Nesbitt, Inc.

**Pure Feed Dairy Ration**

Corn gluten feed, corn distillers' dried grain, soya bean meal, wheat middlings, wheat bran, beet pulp, hominy or corn meal, choice cottonseed meal, old process linseed oil meal, 1% steamed bone meal, 1% calcium carbonate,  $\frac{1}{2}$  of 1% salt. (Bran may contain screenings not to exceed mill run.)

**Pure Feed Egg Mash**

Kelp meal, corn meal, oat flour, wheat bran, wheat flour middlings, leaf alfalfa meal, dried skim milk, meat scraps, fish meal, steamed bone meal, 1% calcium carbonate, cod liver oil.

**Super Pure Sweetfeed Dairy Ration**

Corn gluten feed, corn distillers' dried grains, soya bean meal, choice cottonseed meal, old process linseed oil meal, wheat bran, hominy or corn meal, pure cane molasses, 1% steamed bone meal, 1% calcium carbonate,  $\frac{1}{2}$  of 1% salt. (Bran may contain screenings not to exceed mill run.)

**Uniform Sweet Dairy Ration**

Choice cottonseed meal, soya bean meal, corn gluten feed, hominy feed or corn meal, rye distillers' grains, wheat bran, oat middlings, oat shorts, oat hulls, bolted ground wheat screenings, pure cane molasses, 1% calcium carbonate and 1% salt.

Est. M. G. Williams

**Williams Balanced Ration**

Corn meal or hominy, linseed oil meal, cotton seed meal, ground oats, gluten feed, dried brewers grains, wheat feed, soy bean meal, calcium carbonate, and 1% salt.

**Williams Chick Starter**

Corn meal, bran, middlings, feeding oatmeal, fish meal, dried skim milk, leaf meal, meat scraps, calcium carbonate, salt and cod liver oil.

**Williams Growing Feed**

Corn meal, bran, middlings, feeding oatmeal, dried skim milk, leaf meal, meat scraps, calcium carbonate, salt, cod liver oil, and fish meal.

**Williams Laying Mash**

Corn meal, bran, middlings, ground oats, meat scraps, fish meal, dried skim milk, calcium carbonate, salt, cod liver oil, and leaf meal.

Stanley Wood Grain Co.

**Bliss Dairy Ration**

Corn meal (or hominy), cottonseed meal, wheat bran, soy bean meal, linseed meal, wheat middlings, gluten meal, gluten feed, table salt, edible bonemeal, calcium carbonate, beet pulp.

**Preferred Laying Mash**

Pure dried skim milk, dried fish meal, alfalfa leaf meal, beef scraps, yellow corn meal, wheat bran, soy bean meal, pulverized oats, wheat middlings, edible bonemeal, table salt, calcium carbonate.

**Preferred Starting & Growing Feed**

Pure dried skim milk, dried fish meal, yellow corn meal, wheat bran, wheat middlings, fine ground oatmeal, alfalfa leaf meal, beef scraps, edible bonemeal, table salt, calcium carbonate.

**Woods Dairy Ration**

Cottonseed meal, wheat middlings, yellow corn meal (or hominy), soy bean meal, ground oats, old process linseed oil meal, corn gluten feed, dried beet pulp, wheat bran, salt, calcium carbonate.



## Average Analyses of Unmixed By-Products.

(Collected between September 1, 1935 and April 1, 1936)

	Num- ber of Samples.	*Water (Per Cent).	Protein (Per Cent).	Fat (Per Cent).	Nitro- gen Free Extract (Per Cent).	Fiber (Per Cent).	Ash (Per Cent).
Cottonseed Meal . . .	54	7.6	41.1	6.5	27.9	10.8	6.1
Linseed Meal . . .	19	9.5	34.5	5.3	36.7	8.3	5.7
Soy Bean Oil Meal . . .	14	9.1	41.3	5.3	32.9	5.7	5.7
Gluten Meal . . .	12	8.6	44.2	1.8	41.9	2.0	1.5
Gluten Feed . . .	29	10.0	28.4	2.5	45.4	6.8	6.9
Distillers Dried Grains . .	12	6.7	30.6	9.0	39.9	12.1	1.7
Brewers Dried Grains . .	14	6.8	28.6	6.3	40.9	14.2	3.2
Wheat Standard Middlings	23	11.8	17.8	5.1	53.6	7.4	4.3
Wheat Flour Middlings . .	3	11.5	17.3	4.7	58.5	4.5	3.5
Red Dog Flour . . .	11	12.2	17.0	3.2	63.0	2.4	2.2
Wheat Mixed Feed . . .	42	12.5	16.8	4.5	53.9	7.4	4.9
Wheat Bran . . .	62	13.2	16.2	4.7	50.5	9.8	5.6
Rye Feed . . .	1	12.0	17.2	3.1	60.4	3.9	3.4
Corn Meal . . .	32	15.0	9.6	4.7	67.0	2.1	1.6
Ground Oats . . .	50	11.5	12.6	4.0	57.7	10.8	3.4
Hominy Feed . . .	28	11.5	11.0	7.5	63.2	4.1	2.7
Dried Beet Pulp . . .	9	11.4	9.6	0.6	56.4	17.9	4.1
Oat Feed . . .	7	8.9	5.9	1.8	50.3	27.4	5.7

\*A considerable difference will be noted in some instances between the water content as reported in this table and similar tables in previous bulletins which show the water content of the feeds as analyzed. There is an unavoidable loss of water between the time of sampling and analysis. In this table an attempt has been made to more nearly show the water content as contained in the feeds when offered for sale by the retailer.

**Oats — Test Weight per Bushel versus Chemical Composition.<sup>1</sup>**

To supply authentic information to those interested in the purchase of feed for a group of state institutions, an attempt was made during the summer of 1936 to determine the correlation between test weight per bushel and chemical analysis of whole oats. Fifty-five samples were collected from feed stores, state institutions, and grain elevators, of which thirty-three were used for purposes of comparison. The remaining twenty-two samples were discarded because they were less than 95 per cent pure and it was thought that oats containing a liberal percentage of barley and other cereals would be so affected both as to test weight and chemical composition as to be worthless for the purpose. The results for this group are presented in a separate table.

The following summary shows the average chemical analysis of the samples grouped according to weight. The most marked differences were in the fat and fiber content. No consistent difference was found in the protein, nitrogen free extract, and fat.

The oats tested were from the 1935 crop. New oats would probably show a somewhat higher water content, which to an unascertained extent might influence their test weight.

**Average Composition of Oats of Different Weights per Bushel.  
95% Purity or Better.**

Weight per Bushel Pounds	Number of Samples	Water	Protein	Fat	Nitrogen Free Extract	Fiber	Ash
40 to 45 . .	6	9.18	11.44	5.70	60.83	9.19	3.66
38 to 40 . .	5	11.01	12.60	4.54	59.43	9.40	3.02
37 to 38 . .	7	10.73	12.21	4.51	59.27	10.11	3.17
35 to 37 . .	9	10.01	12.08	4.87	59.48	10.22	3.34
31 to 35 . .	6	10.85	12.29	4.49	58.60	10.56	3.21

<sup>1</sup>Physical analyses of samples were made by F. A. McLaughlin and Olive M. Hoefle of the State Seed Testing Laboratory.

## Oats, 95% Purity or Better.

Laboratory Number	PHYSICAL ANALYSIS							CHEMICAL ANALYSIS							
	Weight per Bushel Pounds.	Weight of 1,000 Seeds, Grams.	Oats Per Cent.	Inert Matter Per Cent.	Weed Seed Per Cent.	Other Grain Per Cent.	Wheat Per Cent.	Rye Per Cent.	Barley Per Cent.	Water Per Cent.	Protein Per Cent.	Fat Per Cent.	Nitrogen Free Extract Per Cent.	Fiber Per Cent.	Ash Per Cent.
30 . . .	31.3	24.91	97.24	2.25	0.28	0.23	0.19	—	0.04	9.95	12.39	4.70	58.96	10.61	3.39
35 . . .	33.0	19.54	98.07	0.58	0.02	1.33	0.37	0.02	0.94	11.37	11.64	4.54	58.75	10.68	3.02
51* . . .	33.3	24.96	96.53	1.00	0.04	2.43	0.15	—	2.43	10.65	13.31	4.18	57.89	10.72	3.25
40 . . .	34.1	24.29	98.74	0.16	0.01	1.09	0.13	—	0.96	10.24	12.08	4.45	59.06	10.64	3.53
21 . . .	34.5	21.29	97.29	0.55	0.02	2.14	0.08	0.03	2.03	11.52	12.74	4.60	58.01	9.90	3.23
33 . . .	34.7	23.43	99.59	0.23	—	0.18	—	—	0.18	11.38	11.60	4.48	58.89	10.82	2.83
46 . . .	35.2	22.03	95.88	2.12	0.05	1.95	0.37	0.01	1.57	10.80	12.61	4.13	58.24	11.42	2.80
53 . . .	35.2	21.28	97.05	0.43	0.08	2.44	0.96	—	1.47	9.67	13.75	5.38	57.96	9.64	3.60
31 . . .	36.0	24.57	97.22	0.96	0.41	1.41	1.29	—	0.12	7.78	9.77	6.86	60.96	10.91	3.72
42 . . .	36.1	21.16	98.21	0.75	0.05	0.99	0.29	0.11	0.59	10.98	12.72	4.39	58.84	9.88	3.19
13 . . .	36.4	21.65	98.11	1.04	0.12	0.73	0.04	—	0.69	10.93	11.73	4.90	59.83	9.26	3.35
34 . . .	36.5	23.67	98.15	0.70	0.15	1.00	0.89	—	0.11	9.43	11.60	4.55	60.55	10.42	3.45
38 . . .	36.5	25.17	99.23	0.38	0.01	0.38	0.13	—	0.25	10.60	12.69	4.55	58.70	10.08	3.38
17 . . .	36.6	18.55	98.60	0.70	0.01	0.69	0.17	—	0.52	10.26	12.26	4.35	60.64	9.23	3.26
52 . . .	36.6	20.51	98.60	1.09	0.01	0.30	0.12	—	0.18	9.63	11.60	4.75	59.48	11.11	3.43
37 . . .	37.0	18.48	97.44	1.26	0.05	1.25	0.26	0.12	0.87	9.40	12.26	4.83	60.10	9.94	3.47
39 . . .	37.0	23.49	98.07	0.29	0.03	1.61	0.16	0.04	1.41	11.41	12.82	3.97	59.18	9.65	2.97
45 . . .	37.2	24.12	97.83	0.13	0.02	2.02	0.05	0.02	1.95	11.22	11.99	4.05	59.65	10.28	2.80
55 . . .	37.3	20.38	97.74	0.87	0.04	1.35	0.95	0.13	0.27	10.75	12.17	4.93	58.28	10.62	3.25
44 . . .	37.6	22.32	98.36	0.15	0.09	1.40	1.17	0.06	0.17	10.28	12.04	4.40	58.40	9.80	3.28

47	.	.	37.8	23.41	97.42	0.12	0.06	2.40	1.31	0.42	0.67	10.98	12.08	4.44	59.37	10.08	3.05
54	.	.	37.8	20.14	98.94	0.36	0.03	0.67	0.40	—	0.27	11.03	12.08	4.95	58.13	10.43	3.38
20	.	.	38.2	22.68	98.92	0.12	0.07	0.89	0.09	—	0.89	10.74	11.91	4.84	59.91	9.66	2.94
50	.	.	38.2	23.45	97.35	0.38	0.01	2.26	0.14	—	2.12	11.08	12.52	4.23	59.17	9.90	3.10
36	.	.	38.5	27.17	98.56	0.58	0.10	0.76	0.20	—	0.56	11.33	11.96	5.01	59.50	9.04	3.16
22	.	.	38.7	22.14	96.92	0.78	0.03	2.27	0.36	—	1.91	10.94	13.84	4.24	58.59	9.38	3.01
4	.	.	39.2	22.79	96.82	0.07	0.04	3.07	0.62	—	2.45	10.98	12.78	4.38	59.97	9.00	2.89
6	.	.	42.4	26.62	96.54	0.87	0.18	2.41	1.50	—	0.91	8.50	10.51	5.58	61.94	9.78	3.69
15	.	.	42.8	29.11	95.67	1.16	0.03	3.14	1.62	0.16	1.36	10.04	10.29	4.91	61.21	10.10	3.45
10	.	.	43.5	27.46	97.32	0.57	0.07	2.04	1.59	—	0.45	9.07	11.25	5.72	61.19	9.03	3.74
41	.	.	44.0	28.58	93.62	1.11	0.08	2.19	1.11	—	1.08	9.37	11.29	5.85	61.02	8.78	3.69
19	.	.	44.1	28.34	96.73	0.43	0.02	2.82	0.37	—	2.45	9.05	13.93	6.21	57.77	9.14	3.90
24	.	.	45.3	28.59	96.36	0.16	0.08	3.40	1.83	—	1.52	9.60	11.38	5.91	61.29	8.33	3.49

\*Not clipped. A long variety.

Physical analyses of oat samples are based on one hundred gram portions which were secured by dividing and mixing large sample by means of a Boerner Sampler.

"Weed Seeds" include common types of weeds found in oats, such as wild mustard, black bindweed, quack grass, etc., but do not include wild oats.

"Inert" consists of stems, hulls and like matter, including pin oats which when tried between pinchers appear to contain no groat.

Occasional fragments of corn when found were included with the oats.

## Oats, Less than 95% Purity.

Laboratory Number	PHYSICAL ANALYSIS							CHEMICAL ANALYSIS							
	Weight per Bushel Pounds.	Weight of 1,000 Seeds Grams.	Oats Per Cent.	Inert Matter Per Cent.	Weed Seed Per Cent.	Other Grain Per Cent.	Wheat Per Cent.	Rye Per Cent.	Barley Per Cent.	Water Per Cent.	Protein Per Cent.	Fat Per Cent.	Nitrogen Free Extract Per Cent.	Fiber Per Cent.	Ash Per Cent.
16 .	23.5	13.50	55.80	18.90	1.10	24.20	-	-	-	11.16	10.86	3.69	58.92	11.44	3.93
5 .	30.5	16.51	91.33	5.53	0.14	3.00	0.10	-	2.90	11.09	11.38	4.17	60.41	9.95	3.00
9*	30.6	13.13	94.92	1.41	0.36	3.31	0.23	-	3.08	9.98	12.39	4.28	60.42	9.79	3.14
29**	34.7	16.77	90.33	0.96	0.97	7.74	0.92	0.15	6.67	10.14	13.66	4.10	59.57	9.51	3.02
11***	35.9	16.61	68.96	3.06	0.84	27.14	0.64	-	26.50	10.88	12.12	3.57	61.85	8.52	3.06
25 .	36.1	16.38	40.40	1.45	0.23	57.92	0.28	-	57.64	11.84	12.52	2.90	62.56	6.92	3.26
3 .	36.5	17.19	92.38	1.09	0.07	6.46	0.17	-	6.29	11.30	11.82	4.14	60.33	9.01	2.90
14 .	36.7	18.66	89.88	2.33	0.10	7.69	0.16	-	7.53	9.57	12.52	5.05	59.83	9.57	3.46
18 .	36.8	18.08	92.21	0.47	0.03	7.29	-	-	7.29	11.22	11.82	3.86	62.10	8.08	2.92
32 .	36.8	18.41	89.00	0.93	0.61	9.46	2.68	0.38	6.40	11.67	14.01	3.99	58.51	8.82	3.00
43****	37.1	22.44	90.75	1.10	0.13	8.02	4.29	-	3.73	10.50	12.43	4.35	59.89	10.08	2.75
26 .	37.2	17.53	91.36	0.96	0.02	7.66	0.73	-	6.93	11.55	11.64	3.85	61.52	8.50	2.94
7*	37.3	15.24	43.60	0.60	0.22	55.58	0.39	0.15	55.09	11.64	12.69	3.05	62.70	6.93	2.99
12 .	37.7	17.18	43.64	1.23	0.11	55.02	0.22	-	54.80	11.28	12.83	2.72	63.02	7.17	2.98
28 .	38.4	23.18	93.47	3.89	0.24	2.40	0.59	0.78	1.03	10.42	10.51	4.55	59.88	10.75	3.89
23 .	38.5	22.85	93.59	0.18	0.02	6.21	-	-	6.21	10.71	11.64	4.20	60.75	9.87	2.83
2 .	38.7	16.56	89.22	0.26	0.12	10.40	0.48	0.04	9.88	10.51	12.17	4.34	62.10	8.08	2.80
48 .	39.2	18.64	90.93	0.30	0.06	8.71	0.15	-	8.56	10.83	12.52	3.95	61.48	8.27	2.95
27 .	40.2	22.03	94.85	0.78	0.02	4.35	0.45	0.05	3.85	10.95	13.58	5.02	58.47	8.57	3.41
8 .	40.4	25.01	94.97	0.22	0.01	4.80	0.47	0.14	4.19	11.26	11.99	4.36	60.11	9.47	2.81
1 .	40.5	23.60	90.83	0.10	0.07	9.00	0.79	3.14	5.07	11.42	12.39	3.73	60.24	9.24	2.98
Barley 49 .	45.2	28.81	0.92	0.25	0.13	1.47	0.55	-	98.15	11.35	13.31	1.53	65.73	5.60	2.48

\*Not clipped.

\*\*Contained about 1/2% mustard seed.

\*\*\*Contained much mustard seed.

\*\*\*\*Contained 1.18% corn.

No. 16. An inferior sample. The miller termed this material as "grinding oats". No attempt was made to separate the different kinds of grain it contained, which included corn, peas and other seeds which could not have been found growing with oats in the field.

## Calcium and Phosphorus Content of Commerical

## Starting and Growing Mashcs.

Experimental data which have accumulated during the past decade indicate that an excess as well as a deficiency of calcium and phosphorus should be avoided in the feeding of growing chicks. The Poultry Department of the State College, who give as a reference the Cornell Poultry Nutrition School, furnish the following figures as to the amount and proper proportions of calcium and phosphorus for chick starting and growing mashcs:

Calcium	0.67%
Phosphorus	0.35-0.50%

Ratio 1.3-1.9 parts calcium to 1 part phosphorus. It is probably true that the amounts of these elements needed in a mash will depend somewhat upon the supplementary feed used. Where chicks are fed the so-called complete mash rations it should be possible to fix the amount of calcium and phosphorus consumed within narrow limits.

During the season of 1935-1936 calcium and phosphorus contents were determined on most of the chick and growing mashcs officially collected. The following table of results is published without comment for the benefit of poultrymen who may be interested.

## Calcium and Phosphorus Content of Starting and Growing Mashcs

Number of Samples.	MANUFACTURER AND BRAND	Total Ash Per Cent.	Calcium Per Cent.	Phosphorus Per Cent.	Calcium Phosphorus Ratio.
1	Allied Mills, Inc.				
2	Empire Growing Mash . . .	7.49	1.21	0.87	1.4 : 1
2	Empire Starter & Grower . . .	5.35	1.06	0.76	1.4 : 1
2	Wayne Chick Starter . . .	6.18	1.62	0.92	1.8 : 1
4	Wayne Growing Mash . . .	7.16	2.07	0.98	2.1 : 1
2	A. P. Ames Co.				
1	Ames Complete Growing and Egg Ration . . .	7.38	1.88	1.03	1.8 : 1
2	Ames Growing Mash . . .	8.49	1.68	1.23	1.4 : 1
2	Ames Complete Starter and Broiler Ration . . .	7.87	1.35	1.10	1.2 : 1
2	Arcady Farms Milling Co.				
1	Arcady-Wonder Complete All-Mash Chick Starter . . .	8.44	2.07	0.98	2.1 : 1
1	Arcady-Wonder Growing Mash . . .	10.84	3.02	0.96	3.1 : 1
1	Sunkist Growing Mash . . .	8.17	1.85	0.78	2.4 : 1
2	Beacon Milling Co., Inc.				
1	Beacon's Cayuga Growing Mash . . .	7.36	1.63	1.05	1.6 : 1
1	Beacon Complete Starting Ration . . .	7.00	1.79	0.97	1.8 : 1
1	Borden Grain Co.				
1	Borden's Chick Starting Feed . . .	8.58	2.03	1.14	1.8 : 1
1	Community Feed Stores, Inc.				
1	Community Growing Mash . . .	7.42	1.77	0.83	2.1 : 1
1	Nicolas Courcy Grain Co.				
1	Courcy's Growing Feed . . .	8.86	2.12	1.25	1.7 : 1
1	Eastern Starting Feed . . .	7.82	1.79	1.11	1.6 : 1
2	E. A. Cowee Co.				
3	Coweco Growing Mash . . .	10.23	2.35	1.14	2.1 : 1
3	Coweco Starting Mash . . .	9.07	2.44	1.10	2.2 : 1
3	Coweco Sunrise Growing Mash . . .	11.76	3.23	1.61	2.0 : 1
1	Chas. M. Cox Co.				
1	Utility Growing Ration . . .	6.80	1.79	0.80	2.2 : 1
1	Utility Starting Ration . . .	7.20	2.09	0.93	2.2 : 1
1	Curley Brothers				
1	Crystal All Grain Starting Food . . .	6.46	1.44	0.90	1.6 : 1
1	Crystal Growing Mash . . .	7.26	1.56	1.06	1.5 : 1
1	Premier Growing Mash . . .	9.22	1.89	1.23	1.5 : 1

# Calcium and Phosphorus Content of Starting and Growing Mash — Continued

Number of Samples.	MANUFACTURER AND BRAND	Total Ash Per Cent.	Calcium Per Cent.	Phosphorus Per Cent.	Calcium Phosphorus Ratio.
1	<b>Cutler Co.</b>				
1	King Complete Chick Starter and Broiler Ration	6.85	1.89	0.89	2.1 : 1
1	King Complete Growing Ration	6.12	1.61	0.89	1.8 : 1
1	King Growing Feed	6.73	1.32	0.86	1.5 : 1
1	<b>Delaware Mills, Inc.</b>				
1	Delaware All Mash Chick Starter	7.18	1.74	1.00	1.7 : 1
1	Indian Growing Mash	7.12	1.26	0.95	1.3 : 1
2	<b>Frank Diauto</b>				
	Diauto's Fancy Chick Growing Mash	7.93	1.97	1.01	2.0 : 1
	<b>Dietrich &amp; Gambrill, Inc.</b>				
1	Frederick Growing Mash	6.79	1.26	1.08	1.2 : 1
2	Gambrill's Chick Starter	7.93	1.59	0.92	1.7 : 1
1	Gambrill's Growing Mash	12.58	3.25	1.70	1.9 : 1
	<b>East Bridgewater Farmers' Exchange</b>				
1	Special Growing Feed	5.88	1.28	1.03	1.2 : 1
	<b>Eastern States Farmers' Exchange</b>				
2	Eastern States All-Mash Developer	6.09	1.42	0.85	1.7 : 1
1	Eastern States Developer	7.63	1.65	1.20	1.4 : 1
2	Eastern States Starting and Broiler Ration	7.01	1.54	1.15	1.3 : 1
2	<b>Elmore Milling Co., Inc.</b>				
	Elmore Chixsaver	7.28	1.75	0.92	1.9 : 1
	<b>John W. Eshelman &amp; Sons</b>				
1	Red Rose All Mash Starter	7.62	1.84	1.15	1.6 : 1
1	Red Rose Growing Mash	6.87	1.02	0.97	1.1 : 1
	<b>Farm Service Stores, Inc.</b>				
3	C Growing Mash	8.56	1.92	1.14	1.7 : 1
2	North Star Chick Starter	8.78	2.18	1.26	1.7 : 1
2	North Star Growing Mash	9.85	2.71	1.58	1.7 : 1
2	<b>Flory Milling Co., Inc.</b>				
	Flory's Growing Mash	7.17	1.65	0.81	2.0 : 1
	<b>Fred A. Fountain</b>				
2	Fountain's Buttermilk Growing Feed	8.48	1.99	1.21	1.6 : 1
2	Fountain's Buttermilk Starting Feed	7.04	1.45	0.99	1.5 : 1
	<b>J. B. Garland &amp; Son</b>				
2	Garland's Economy Growing Mash	10.13	2.78	1.44	1.9 : 1
1	Garland's Growing Mash	10.97	2.77	1.62	1.7 : 1
	<b>General Mills, Inc.</b>				
1	Eventually Gold Medal Chick Ration	7.80	2.14	1.03	2.1 : 1
	<b>Goode Grain Co.</b>				
1	Starting and Growing Mash	9.46	2.39	1.27	1.9 : 1
	<b>D. H. Grandin Milling Co.</b>				
1	Grandin's Baby Chick Starter	6.10	1.58	0.83	1.9 : 1
1	Grandin's Combined Chick and Broiler Ration	8.50	2.12	0.98	2.2 : 1
1	Grandin's Complete Starting Ration	7.80	2.35	0.89	2.6 : 1
2	Grandin's Growing Mash	9.99	3.26	1.13	2.9 : 1
	<b>Great Atlantic &amp; Pacific Tea Co.</b>				
1	Daily Growth Chick Starter	7.30	1.85	1.00	1.9 : 1
4	Daily Growth Growing Mash	7.33	1.57	1.03	1.5 : 1
	<b>Great Eastern Feed Mills</b>				
1	"Phoenix" 16% Growing Mash	8.60	2.25	0.95	2.4 : 1
	<b>D. Harbeck</b>				
2	Welcome Growing Mash	8.64	2.16	1.21	1.8 : 1
2	Welcome Starter & Broiler Ration	6.88	1.38	0.95	1.5 : 1
	<b>Jaquith &amp; Co.</b>				
2	Growing Mash	7.21	1.40	1.10	1.3 : 1
1	Starting Feed	9.90	2.65	1.56	1.7 : 1

# Calcium and Phosphorus Content of Starting and Growing Mashcs — Continued

Number of Samples.	MANUFACTURER AND BRAND	Total Ash Per Cent.	Calcium Per Cent.	Phosphorus Per Cent.	Calcium Phosphorus Ratio.
2	<b>Jersee Co.</b>				
1	Just Right Chick Starter . . .	5.98	1.29	0.89	1.4 : 1
	Just Right Growing Mash. . .	7.43	1.65	0.97	1.7 : 1
2	<b>Kasco Mills, Inc.</b>				
2	Apex Complete Grower . . .	6.60	1.35	0.67	2.0 : 1
	Kasco All Mash Chick Food . . .	6.93	1.82	0.81	2.2 : 1
2	<b>Larrowe Milling Co.</b>				
1	Larro Chick Builder . . .	8.77	2.06	1.16	1.8 : 1
2	Larro Chick Starter . . .	7.12	1.89	1.09	1.7 : 1
	Larro Growing Mash . . .	7.45	1.70	0.98	1.7 : 1
1	<b>Mansfield Milling Co.</b>				
	"Mansfield" Chick Growing Feed . .	6.61	1.33	1.17	1.1 : 1
1	<b>Geo. Q. Moon &amp; Co., Inc.</b>				
	Moon's Growing Mash . . .	13.04	4.56	1.81	2.5 : 1
1	<b>Ogden Grain Co.</b>				
1	Pilgrim All Purpose Complete Ration .	8.28	2.36	1.28	1.8 : 1
1	Pilgrim Chick and Broiler Ration . .	6.00	1.17	0.83	1.4 : 1
	Pilgrim Growing Mash . . .	6.48	1.26	0.95	1.3 : 1
1	<b>Park &amp; Pollard Co.</b>				
1	Manamar Chick Starter . . .	8.63	2.11	1.06	2.0 : 1
3	Park & Pollard Chick Starter . . .	7.45	1.68	0.97	1.7 : 1
	Growing Feed . . .	8.99	2.76	0.81	2.4 : 1
1	<b>Phaneuf &amp; Son</b>				
1	O Boy All Mash Starter . . .	5.20	1.04	0.81	1.3 : 1
	O Boy Grower . . .	5.70	1.03	0.80	1.3 : 1
1	<b>Pratt Food Co., Inc.</b>				
	Pratt's Baby Chick Food . . .	8.40	2.42	1.11	2.2 : 1
1	<b>Quaker Oats Co.</b>				
	Quaker Ful-O-Pep Growing Mash . .	6.77	1.28	1.06	1.2 : 1
3	<b>Ralston Purina Co.</b>				
1	Purina Chick Growena . . .	5.59	1.40	0.74	1.9 : 1
	Purina Chick Startena . . .	6.31	1.59	0.83	1.9 : 1
1	<b>D. F. Riley</b>				
1	Riley's Chick & Broiler Ration . . .	6.15	1.10	0.78	1.4 : 1
	Riley's Growing Mash . . .	6.86	1.56	0.95	1.6 : 1
2	<b>Ryther &amp; Warren</b>				
	Minot Chick Mash . . .	8.18	2.44	1.14	2.1 : 1
3	<b>St. Albans Grain Co.</b>				
2	Wirthmore Complete Chick and Broiler Ration . . .	7.14	1.99	0.82	2.4 : 1
	Wirthmore Growing Mash . . .	6.26	1.64	0.91	1.8 : 1
1	<b>United Cooperative Farmers, Inc.</b>				
	United Farmers Starting & Growing Feed . . .	8.61	2.13	1.50	1.4 : 1
1	<b>Unity Feeds, Inc.</b>				
	Unity Complete Starting & Broiler Mash . . .	9.20	2.35	1.11	2.1 : 1
1	<b>C. P. Washburn Co.</b>				
	Made Right Starting and Growing Feed . . .	7.55	1.77	1.11	1.6 : 1
1	<b>H. K. Webster Co.</b>				
2	Blue Seal Chick Starter . . .	6.98	1.59	1.11	1.4 : 1
	Blue Seal Growing Mash . . .	8.89	2.09	1.26	1.7 : 1
2	<b>West-Nesbitt, Inc.</b>				
	Pure Feed Growing Mash . . .	9.43	3.16	1.43	2.2 : 1
2	<b>Est. M. G. Williams</b>				
1	Williams Chick Starter . . .	9.26	3.00	1.14	2.6 : 1
	Williams Growing Feed . . .	7.80	1.30	1.09	1.2 : 1
2	<b>Stanley Wood Grain Co.</b>				
	Preferred Starting & Growing Feed .	8.86	2.26	1.28	1.8 : 1



# Directory of Manufacturers Who Registered Feeding Stuffs for Sale in Massachusetts in 1936.

Acme-Evans Co., Indianapolis, Ind.  
 Albers Bros. Milling Co., Seattle, Wash.  
 Albert Lea Food Products Co., Albert Lea, Minn.  
 E. T. Allen Co., Atlanta, Ga.  
 Allied Mills, Inc., Chicago, Ill.  
 American Maize-Products Co., 100 East 42nd St., New York, N. Y.  
 A. P. Ames Co., Peabody, Mass.  
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.  
 Archer-Daniels-Midland Co., Minneapolis, Minn.  
 Ashcraft-Wilkinson Co., Atlanta, Ga.  
 W. E. Atkinson Co., 27 Water St., Newburyport, Mass.  
 B. & B. Dairy Co., Inc., Margaretville, N. Y.  
 Edward R. Bacon Grain Co., Chicago, Ill.  
 E. W. Bailey & Co., Montpelier, Vt.  
 Barber & Bennett, Inc., Albany, N. Y.  
 Bay State Milling Co., Winona, Minn.  
 Beacon Milling Co., Inc., Cayuga, N. Y.  
 Berkshire Coal & Grain Co., Inc., North Adams, Mass.  
 Bisbee Linseed Co., 2100 Lincoln-Liberty Bldg., Philadelphia, Penn.  
 Blatchford Calf Meal Co., Waukegan, Ill.  
 Borden Grain Co., 26 Granite St., Taunton, Mass.  
 C. W. Brister & Son, Auburn, N. Y.  
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Company of North America.)  
 Geo. B. Brown, Ipswich, Mass.  
 Buckeye Cotton Oil Co., Cincinnati, Ohio.  
 C. W. Burkhalter, Inc., 177 Franklin St., New York, N. Y.  
 Butman Feed Co., Lynn, Mass.  
 Cairo Meal & Cake Co., Cairo, Ill.  
 A. B. Caple Co., Sta. A, Box 27, Toledo, Ohio.  
 Center Milk Products Co., Middlebury Center, Penn.  
 Central Soya Co., Inc., Decatur, Ind.  
 Chapin & Co., Hammond, Ind.  
 Checkerboard Elevator Co., St. Louis, Mo.  
 Checkerboard Feed Store, Oswego, N. Y.  
 Clinton Co., Clinton, Iowa.  
 Coatsworth & Cooper, 67 Yonge St., Toronto, Canada.  
 Commander-Larabee Corp., Minneapolis, Minn.  
 Community Feed Stores, Inc., South Deerfield, Mass.  
 Continental Distilling Corp., 260 South Broad St., Philadelphia, Penn.  
 Corn Products Refining Co., 17 Battery Place, New York, N. Y.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Nicolas Courcy Grain Co., 11 Waverly St., Taunton, Mass.  
 Cover & Palm Co., Lowell, Mass.  
 E. A. Cowee Co., Fitchburg, Mass.  
 Chas. M. Cox Co., 177 Milk St., Boston, Mass.  
 Curley Brothers, Main St., Wakefield, Mass.  
 Culter Co., North Wilbraham, Mass. (Registered by St. Albans Grain Co.)  
 Dairymen's League Co-operative Association, Inc., 11 West 42nd St., New York, N. Y.  
 Dawe's Products Co., Denver, Col.  
 Decatur Milling Co., Inc., Decatur, Ill.  
 Delaware Mills, Inc., Deposit, N. Y.  
 Denver Alfalfa Milling & Products Co., Lamar, Col.  
 Dewey Bros. Co., Blanchester, Ohio.  
 Frank Diauto, 87 Warren St., Randolph, Mass.  
 F. Diehl & Son, Inc., Wellesley, Mass.  
 Dietrich & Gambrill, Inc., Frederick, Md.  
 Drimolass Refining Corp., 318 East 95th St., New York, N. Y.  
 J. L. Dunnell & Son, Bernardston, Mass.  
 Eagle Roller Mill Co., New Ulm, Minn.  
 East Bridgewater Farmers' Exchange, East Bridgewater, Mass.  
 Eastern Grain Co., Bridgewater, Mass.  
 Eastern States Farmers' Exchange, Box 1482, Springfield, Mass.  
 Economy Grocery Stores Corp., 393 D St., Boston, Mass.  
 Egg-O-Milk Co., Baltimore, Md.  
 Michael W. Ellis, 19 Walnut St., Peabody, Mass.  
 Elm City Creamery, Inc., 3 Pleasant St., Fairhaven, Mass.  
 Elmore Milling Co., Inc., Oneonta, N. Y.  
 John W. Eshelman & Sons, Lancaster, Penn.  
 Evans Milling Co., Indianapolis, Ind.  
 Fairchild Milling Co., 1635 Merwin St., Cleveland, Ohio.  
 Fairmont Creamery Co., Omaha, Neb.  
 Farm Service Stores, Inc., Fitchburg, Mass.  
 Farmers Feed Co., 532 East 76th St., New York, N. Y.  
 Federal Mill, Inc., Lockport, N. Y.  
 Fernando Valley Milling & Supply Co., 336 I. W. Hellman Bldg., Los Angeles, Cal.  
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.  
 Flory Milling Co., Inc., Bangor, Penn.  
 J. A. Forrest Co., 822 Security Bldg., Minneapolis, Minn.  
 Fred A. Fountain, 355 Tremont St., Taunton, Mass.  
 Dean S. French, 1506 Central St., West Stoughton, Mass.  
 Fruen Milling Co., Minneapolis, Minn.  
 Paul Fuller & Sons, Mooney Ave., Salem, Mass.  
 J. B. Garland & Son, Worcester, Mass.  
 General Commodity Corp., Buffalo, N. Y.  
 General Mills, Inc., Chamber of Commerce Bldg., Minneapolis, Minn.

Geneva Milling Co., Inc., 612 South Exchange St., Geneva, N. Y.  
 J. T. Gibbons, Inc., New Orleans, La.  
 W. K. Gilmore & Sons, Inc., Walpole, Mass.  
 Goode Grain Co., 452 Broadway, Lowell, Mass.  
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.  
 Grand Union Stores, Inc., 233 Broadway, New York, N. Y.  
 D. H. Grandin Milling Co., Jamestown, N. Y.  
 Great Atlantic & Pacific Tea Co., New York, N. Y.  
 Great Eastern Feed Mills, Phoenix Ave., Lowell, Mass.  
 Hales & Hunter Co., 166 West Jackson Blvd., Chicago, Ill.  
 Frank B. Ham & Co., Ltd., 1506 Royal Bank Bldg., Toronto, Canada.  
 Wm. Hamilton & Son, Inc., Caledonia, N.Y.  
 Dwight Hamlin Co., Diamond Bank Bldg., Pittsburgh, Penn.  
 D. Harbeck, 405 Earl St., New Bedford, Mass.  
 Hecker — H-O Co., Inc., Buffalo, N. Y.  
 Hecker-Jones-Jewell Milling Division of Standard Milling Co., 503 Seneca St., Buffalo, N. Y.  
 W. D. Higgins Co., Framingham, Mass.  
 Hirst & Begley Linseed Works, 2013 Mendel St., Chicago, Ill.  
 D. B. Hodgkins' Sons, Gloucester, Mass.  
 Horvitz Grain Co., New Bedford, Mass.  
 Hubinger Co., Keokuk, Iowa.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 Independent Tallow Co., Inc., 39 Cedar St., Woburn, Mass.  
 International Milling Co., Minneapolis, Minn.  
 International Vegetable Oil Co., Inc., Savannah, Ga.  
 Jaquith & Co., 305 Main St., Woburn, Mass.  
 Jersee Co., Minneapolis, Minn. (Registered by Worcester Grain & Coal Co.)  
 Joslin-Schmidt Corp., Lockland Sta., Cincinnati, Ohio.  
 Kansas Flour Mills Corp., Kansas City, Mo.  
 Kasco Mills, Inc., Waverly, N. Y.  
 Kellogg Co., Battle Creek, Mich.  
 Kellogg Company of Canada, Ltd., London, Ont., Canada.  
 Kelloggs & Miller, Inc., Amsterdam, N. Y.  
 Spencer Kellogg & Sons, Inc., Buffalo, N. Y.  
 H. H. King Flour Mills Co., Minneapolis, Minn.  
 Chas. A. Krause Milling Co., Milwaukee, Wis.  
 Lake of the Woods Milling Co., Ltd., Montreal, Que., Canada.  
 Larowe Milling Co., Box 68, North End Sta., Detroit, Mich.  
 Louisiana State Rice Milling Co., Inc., Abbeville, La.  
 L. B. Lovitt & Co., Memphis, Tenn.  
 A. S. MacDonald Commission Co., 404 Grain & Flour Exchange, Boston, Mass. (Registered for  
     Parrish & Heimbecker, Ltd.)  
 Maine Fish Meal Co., Portland, Maine.  
 Mansfield Coal & Grain Co., Mansfield, Mass.  
 Mansfield Milling Co., 1 Samoset Ave., Mansfield, Mass.  
 Maple Leaf Milling Co., Ltd., Toronto, Canada. (Registered by Traders Feed & Grain Co., Inc.)  
 Maritime Milling Co., Inc., Buffalo, N. Y.  
 Mellin's Food Company of North America, 41 Central Wharf, Boston, Mass. (Registered for A.  
     H. Brown & Bros.)  
 Merrimack Farmers' Exchange, Inc., Concord, N. H.  
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.  
 Monti-Van Iderstine, Inc., 272 Hudson Ave., Brooklyn, N. Y.  
 Geo. Q. Moon & Co., Inc., Binghamton, N. Y.  
 Jas. F. Morse & Co., Somerville, Mass.  
 Mt. Vernon Milling Co., Mt. Vernon, Ind.  
 Muir & Co., 408 Produce Exchange Bldg., New York, N. Y.  
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.  
 National Mineral Products Co., Ltd., 830-832 Seventh St., San Francisco, Cal.  
 New England Chemical Industries, Inc., Woburn, Mass.  
 New England Dairies, Inc., 51 Cornhill, Boston, Mass.  
 New England Rendering Co., Brighton, Mass.  
 New Jersey Flour Mills Co., Clifton, N. J.  
 Niagara Falls Milling Co., Lockport, N. Y.  
 Northwestern Consolidated Milling Division of Standard Milling Co., 1013 Metropolitan Life  
     Bldg., Minneapolis, Minn.  
 Nowak Milling Corp., Hammond, Ind.  
 Ogden Grain Co., Utica, N. Y.  
 Ogilvie Flour Mills Co., Ltd., Montreal, Que., Canada.  
 Pacific Bone Coal & Fertilizing Co., San Francisco, Cal. (Affiliate of New England Chemical  
     Industries, Inc.)  
 Paetow Co., Grain & Stock Exchange, Milwaukee, Wis.  
 Philip R. Park, Inc., Naval Station, San Pedro, Cal.  
 Park & Pollard Co., 356 Hertel Ave., Buffalo, N. Y.  
 George H. Parker Grain Co., Danvers, Mass.  
 Parrish & Heimbecker, Ltd., Toronto, Canada. (Registered by A. S. MacDonald Commission Co.)  
 Patent Cereals Co., Geneva, N. Y.  
 Pecos Valley Alfalfa Mill Co., Hagerman, N. M.  
 Penick & Ford Ltd., Inc., Cedar Rapids, Iowa.  
 Phaneuf & Son, 188 Rivet St., New Bedford, Mass.  
 Pillsbury Flour Mills Co., Minneapolis, Minn.  
 Maurice Pincoffs Co., 631 M & M Bldg., Houston, Texas.  
 Post Products Division of General Foods Corp., Battle Creek, Mich.  
 W. N. Potter Grain Stores, Inc., Greenfield, Mass.  
 Pratt Food Co., Inc., Buffalo, N. Y.  
 H. C. Puffer Co., Springfield, Mass.  
 Quaker Oats Co., Chicago, Ill.  
 Ralston Purina Co., St. Louis, Mo.  
 John Reardon & Sons Co., Cambridge, Mass.  
 D. F. Riley, North Hatfield, Mass.  
 Robin Hood Mills Ltd., Moose Jaw and Calgary, Canada.

N. Roy & Son, Rear 618 Newport Ave., South Attleboro, Mass.  
H. M. Rubin Co., Inc., 9-19 38 Ave., Long Island City, N. Y.  
Russell-Miller Milling Co., Minneapolis, Minn.  
Ryther & Warren, Belchertown, Mass.  
St. Albans Grain Co., St. Albans, Vt., (Registered also for Cutler Co., and Taft Bros.)  
St. Lawrence Flour Mills Co., Ltd., 2110 Notre Dame St., West, Montreal, Canada.  
Seaboard Western Grain Corp., 2 Broadway, New York, N. Y.  
Sheffield Farms Co., Inc., 524 West 57th St., New York, N. Y.  
Shellabarger Grain Products Co., 1900 North Samuels St., Decatur, Ill.  
Sherwin-Williams Co., 101 Prospect Ave., Cleveland, Ohio  
Mrs. Annie P. Smith, 102 Hale St., Haverhill, Mass.  
Smith, Bodfish, Swift Co., Vineyard Haven, Mass.  
A. E. Staley Manufacturing Co., Decatur, Ill.  
State Mill & Elevator, Grand Forks, N. D.  
F. W. Stock & Sons, Hillsdale, Mich.  
Stratton & Co., Concord, N. H.  
Stratton Grain Co., Milwaukee, Wis. (Successors to Donahue-Stratton Co.)  
Swift & Company, Oil Mills, Atlanta, Ga.  
C. H. Symmes & Co., Winchester, Mass.  
Syracuse Milling Co., P. O. Box 1141, Syracuse, N. Y.  
Taft Bros., Uxbridge, Mass., (Registered by St. Albans Grain Co.)  
Tioga Mills, Inc., Waverly, N. Y.  
Traders Feed & Grain Co., Inc., 609 Chamber Commerce, Buffalo, N. Y. (Registered for Maple Leaf Milling Co., Ltd.)  
Jacob Trinley & Sons, Linfield, Penn.  
Union Starch & Refining Co., Columbus, Ind.  
United Cooperative Farmers, Inc., Fitchburg, Mass.  
Unity Feeds, Inc., 177 Milk St., Boston, Mass.  
Upper Hudson Rye Flour Mills, 7 Madison St., Troy, N. Y.  
Arthur Ventura Grain Co., 7 Purchase St., Taunton, Mass.  
Victor Flour Mills, Inc., Pittsford, N. Y.  
Hiram Walker & Sons, Inc., Foot of Edmund St., Peoria, Ill.  
C. P. Washburn Co., Middleboro, Mass.  
Wayne County Grangers Feed Corp., Clyde, N. Y.  
H. K. Webster Co., Lawrence, Mass.  
West-Nesbitt, Inc., Oneonta, N. Y.  
Wilber Feed Co., Inc., Jamestown, N. Y.  
Wilbur-Ellis Co., Inc., 17 Battery Place, New York, N. Y.  
Est. M. G. Williams, Box 603, Taunton, Mass.  
Wilson & Co., Inc., 41st & Ashland Ave., Chicago, Ill.  
Stanley Wood Grain Co., Taunton, Mass.  
Worcester Grain & Coal Co., Worcester, Mass. (Registered for Jersee Co., Minneapolis, Minn.)

# MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN NO. 86

NOVEMBER, 1936

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## Seed Inspection

By F. A. McLaughlin

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This Report, the ninth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1936, by the Commissioner of Agriculture, who is named in the Act as Administrative Officer (Acts and Resolves of 1927, Chapter 274.)

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Massachusetts State College  
Amherst, Mass.

## ANNOUNCEMENT

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any resident firm or citizen of Massachusetts.

Units are rated as follows:

	Units
Purity analysis (red clover, timothy, etc.).....	1
Purity analysis (bluegrass, orchard grass, etc.).....	2
Purity analysis of a mixtures of seeds (depending upon the number of kinds in the mixture).....	4-10
Examination for noxious weeds (4 oz. or fraction thereof) of samples not mixtures.....	1
Examination for noxious weeds (4 oz. or fraction thereof) of mixtures.....	4-10
Identification of seed or plant.....	1
Cleaning tobacco seed (4 oz. or fraction thereof).....	2
Germination tests (4 x 100 seeds of any seed not chaffy or requiring a purity test).....	1
Germination tests (soil, 2 x 100 seeds).....	1
Germination tests (chaffy grasses or seeds requiring purity analysis).....	2-4

Fees for work in excess of the ten free units allowed are as follows:

Germination test except for grasses other then timothy, but including clovers and alfalfa — thirty cents each.

Germination tests of grasses except timothy — fifty cents each.

Purity analyses of cereals — fifty cents each.

Purity analyses of timothy, and all other kinds of crop seeds, except grasses — seventy-five cents each.

Purity analyses of grasses and of all mixtures of not more than two kinds of agricultural seeds — one dollar each.

Purity analyses of special mixtures, including lawn grasses and pasture mixtures, a charge sufficient to cover the actual cost of working the sample, the amount of such fee depending entirely upon the character of the sample submitted for test, — minimum charge, one dollar and twenty-five cents.

In no case will the final report be rendered until all fees are paid.

# SEED INSPECTION

By F. A. McLaughlin<sup>1</sup>

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This bulletin gives the results of analysis of official seed samples collected by the State Department of Agriculture, during the year 1936, from the open markets in 76 towns and cities of Massachusetts and analyzed at the Seed Testing Laboratory of the Massachusetts Agricultural Experiment Station at Amherst. Between October 1, 1935 and October 1, 1936, the Seed Laboratory analyzed 1,439 samples, of which 850 were collected by the State Department of Agriculture and 589 submitted by dealers and farmers. In addition, 203 ingredients, found in special mixtures, were given viability tests as a check on the quality of seeds in these mixtures, sampled during 1936. The total number of samples worked in the laboratory, therefore, really amounts to 1,642 without taking into account many retests made necessary by certain samples falling far below the given guarantee.

This bulletin also contains results of field tests for trueness to type of 150 lots of vegetable seeds and 104 lots of flower seeds. Comments, together with the analytical tables of the flower seeds used in field tests are also given. An increased number of samples of onion seed produced in the Connecticut Valley gave us an opportunity to investigate the methods employed in cleaning this seed and, by developing a cleaning method for the lots of onion seed submitted to the laboratory for cleaning and for viability tests, to draw certain conclusions as to the quality of this locally-produced seed. Comments and an analytical table are presented in this bulletin.

## Explanation of the Tables

In these tables the seeds are listed in alphabetical order by groups, each group containing only those seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. Section 261-A of the Acts and Resolves of 1927, Chapter 274, defines the group from Alfalfa to Timothy, inclusive; Section 261-B, Mixtures; Section 261-C, Special Mixtures; and Section 261-D, Vegetables.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F", what was found in the laboratory analysis. Attention is called to certain irregularities by the following:

The asterisk (\*) shows violation in labeling.

Boldface type indicates low purity, low germination, excessive weed seed, noxious weeds not declared, or excessive inert material, depending upon the column in which it is found.

Other deficiencies are enumerated as follows:

- (1) Noxious weeds found.
- (2) Old seed (as shown by given date or by correspondence with the wholesaler).
- (3) Ingredient found, but not declared.
- (4) Ingredient declared, but not found.
- (5) Ingredient declared, but percentage found after adding proper tolerance is less than 5%.
- (6) Term not specific.

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<sup>1</sup>Assisted by Miss Olive M. Hoefle, Technical Assistant

The letter "R" after the germination percentage in the table of vegetable seeds indicates that the sample has received one or more retests.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except in those tables which list seeds falling under sections of the law not requiring purity or germination on the label. For the application of "Purity Tolerance", the sample is considered as made up of two component parts: (1) the component being considered, and (2) the balance of the sample. The tolerance in percentage allowed for each component shall be two-tenths of one per cent (0.2%) plus twenty per cent (20%) of the lesser of the two parts. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

<i>Given Germination</i>	<i>Allowable Variation (%)</i>
90 or over.....	6
80 or over, but less than 90.....	7
70 or over, but less than 80.....	8
60 or over, but less than 70.....	9
Less than 60.....	10

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
<b>ALFALFA</b>							
116	GRAVER, DICKINSON SEED CO., Buffalo, N. Y. Grimm Alfalfa..... Cutler Coal & Grain Co., Palmer	99.26 99.42	.06 .03	— .11	.15 .44	79 82-8	* 5/36
46	EASTERN STATES FARMERS' EXCHANGE, West Springfield Grimm Alfalfa..... Eastern States Farmers' Exchange, West Springfield	* 99.84	* .10	— .03	— .03	* 75 19(R)	* 4/36
295	THOMAS W. EMERSON CO., Boston Grimm Alfalfa..... O. B. Parks, Westfield	99.52 99.66	.07 .02	— .21	— .11	95 86-5(R)	* 5/36
106	STANFORD SEED CO., Buffalo, N. Y. Alfalfa..... C. A. Smith, Ludlow	99.82 99.53	.10 .15	— .17	— .15	90 79-0(R)	* 6/36
290	N. WERTHEIMER & SONS, Ligonier, Ind. Grimm Alfalfa..... Smith Feed Co., Westfield	99.50 99.54	.09 .20	.33 .15	.08 .11	90 62 26(R)	* 4/36
73	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Alfalfa, Lot 802..... Foster-Farrar, Northampton	99.00 99.54	.35 .13	— .09	— .24	93 75 17(R)	* 4/36
<b>BARLEY</b>							
178	W. F. COBB CO., Franklin 6-Row Barley..... W. F. Cobb Co., Franklin	99.50 96.80	.30 .20	— .62	.20 2.38	97 98	12/35 5/36
292	THOMAS W. EMERSON CO., Boston Barley (6)..... O. B. Parks Co., Westfield	* 97.93	— .00	— .94	— 1.13	* 94	* 5/36
1001	ROSS BROS. CO., Worcester Velvet Barley..... Ross Bros. Co., Worcester	* 99.82	— .00	— .16	— .02	* 98	* 5/36
<b>BENT GRASS</b>							
423	THOMAS W. EMERSON CO., Boston Astoria Bent..... Elwood Adams Inc., Worcester	97.00 97.18	* .29	— 2.51	— .02	90 80(R)	1/36 6/36



## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	(Germi- nation %)	Date of Seed Test
<b>STANFORD SEED CO., Buffalo, N. Y.</b>							
83	Creeping Bent (German) (Contains, also, <i>Agrostis alba</i> , <i>Redtop</i> and <i>Agrostis tenuis</i> , var. <i>Astoria</i> Bent).....	84.00	1.00	—	—	78	*
	Carlisle Hardware Co., Springfield	86.34	.32	13.19	.15	64(R)	7/36
<b>WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.</b>							
339	Creeping Bent.....	*	*	—	—	*	*
	J. B. Sibley & Son, Ware	95.99	.14	1.38	2.49	61	6/36
<b>BLUEGRASS</b>							
<b>ALBERT DICKINSON CO., Chicago, Ill.</b>							
88	Kentucky Bluegrass.....	85.70	.20	—	—	83	*
	H. C. Puffer Co., Springfield	83.80	.30	15.80	.10	82	6/36
<b>DOUGHTEN SEED CO., Jersey City, N. J.</b>							
55	Kentucky Bluegrass.....	85.00	.20	—	—	80	*
	Frentiss Brooks Co., Holyoke	83.74	.27	15.90	.09	75	6/36
81	Kentucky Bluegrass.....	*	*	—	—	*	*
	Grange Store, Amherst	83.49	.21	16.25	.05	66(R)	7/36
<b>THOMAS W. EMERSON CO., Boston</b>							
37	Kentucky Bluegrass.....	*	*	—	—	*	*
	L. E. Smith, Gloucester	74.84	.67	21.24	3.25	42(R)	5/36
<b>ROSS BROS. CO., Worcester</b>							
1002	Kentucky Bluegrass.....	86.20	.41	—	—	80	*
	Ross Bros. Co., Worcester	84.02	.27	15.43	.28	74(R)	6/36
1005	Canada Bluegrass.....	86.25	.05	—	—	85	*
	Ross Bros. Co., Worcester	91.97	.06	6.59	1.38	84(R)	6/36
<b>WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.</b>							
48	Kentucky Bluegrass.....	84.70	.63	—	—	75	11/34
	J. Russell & Co., Holyoke	88.39	.04	11.52	.05	55(R)	7/36
86	Fancy Kentucky Bluegrass.....	80.00	.55	—	—	80	*
	Carlisle Hardware Co., Springfield	78.32	.48	21.10	.10	78	6/36
<b>BUCKWHEAT</b>							
<b>W. F. COBB CO., Franklin</b>							
183	Buckwheat, Japanese.....	99.50	—	.50	—	98	12/35
	W. F. Cobb Co., Franklin	99.90	.00	.10	.00	98	5/36

1058	ROSS BROS. CO., Worcester Buckwheat (6).....	L. F.	* 99.96	.01	— .03	— .00	* 98	* 5/36
ALSIKE CLOVER								
395	ALBERT DICKINSON CO., Chicago, Ill. Alsiike Clover (2).....	L. F.	98.15 98.59	.10 .05	— .33	— 1.03	88.8 81-10	11/32 5/36
142	CRAYER, DICKINSON SEED CO., Buffalo, N. Y. Alsiike Clover.....	L. F.	98.30 98.54	.30 .17	— .33	— .96	82 73 8(R)	2/36 7/36
1046	THOMAS W. EMERSON CO., Boston Alsiike Clover.....	L. F.	99.21 99.46	.24 .18	— .22	— .14	97.5 75.23	1/36 5/36
50	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Alsiike Clover.....	L. F.	98.62 98.70	.44 .16	— .36	— .78	81.8 81-12	* 4/36
74	Alsiike Clover..... Foster-Farrar, Northampton	L. F.	* 99.38	* .27	— .15	— .20	* 79-12	* 4/36
RED CLOVER								
122	ALLIED SEED CO. INC., Philadelphia, Pa. Red Clover.....	L. F.	99.50 99.44	.14 .21	— .18	— .17	95.2 86-2(R)	3/35 6/36
182	W. F. COBB CO., Franklin Red Clover.....	L. F.	99.78 99.54	.08 .18	.10 .23	— .05	90 87-5(R)	11/35 7/36
141	CRAYER, DICKINSON SEED CO., Buffalo, N. Y. Red Clover.....	L. F.	* 98.97	* .19	— .15	— .69	* 75-6	* 6/36
384	Red Clover..... Berkshire Coal & Grain Co., North Adams	L. F.	98.68 99.07	.56 .43	— .33	— .17	82 86-8	1/36 5/36
394	Red Clover..... C. A. Pierce, Hinsdale	L. F.	99.25 99.31	.16 .18	— .44	— .07	88 91-2(R)	2/36 6/36
137	DOUGHTEN SEED CO., Jersey City, N. J. Red Clover, Freedom.....	L. F.	99.50 98.72	.15 .74	.20 .20	.15 .34	85 78-18(R)	* 6/36

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
RED CLOVER — Concluded							
1045	THOMAS W. EMERSON CO., Boston Red Clover..... W. M. Lee, Clinton	99.60 98.28	.02 .82	— .10	—	91 70-5(R)	1/36 5/36
1060	Red Clover, Gem (2)..... Taft Bros., Uxbridge	99.22 99.27	.22 .17	— .27	— .29	91 86-3	*34 5/36
105	STANFORD SEED CO., Buffalo, N. Y. Red Clover..... C. A. Smith, Ludlow	99.00 98.94	.32 .45	— .20	— .41	— 90-2	* 6/36
109	Red Clover..... R. E. Faulkner, Palmer	99.13 98.79	.22 .24	— .08	— .89	86 90-5	* 6/36
143	Red Clover..... E. J. Adams & Son, Great Barrington	99.00 99.07	.44 .43	— .22	— .28	86-8 85-10	* 5/36
32	WILLIAM G. SCARLETT & CO., Baltimore, Md. Red Clover, Lot 260A..... Franklin Hardware Co., North Attleboro	99.00 98.66	.20 .17	— 1.08	— .09	90 70-7(R)	* 4/36
69	N. WERTHEIMER & SONS, Ligonier, Ind. Medium Red Clover..... W. N. Potter's Sons, Northampton	97.03 90.43	1.19 7.07	— 1.39	— 1.11	90 84-5	* 4/36
99	Medium Red Clover..... Smith Feed Co., Westfield	98.52 95.11	.06 2.74	.18 .63	1.24 1.52	90 88-2(R)	* 6/36
112	Medium Red Clover..... Cutler Coal & Grain Co., Palmer	97.00 95.64	1.16 2.60	.65 .58	1.19 1.18	90 81-6	* 6/36
33	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Red Clover, 5557..... W. K. Gilmore & Son, Walpole	99.00 98.89	.30 .32	— .12	— .67	89-6 91-3	2/36 5/36
63	Pan American Red Clover..... Charles E. Terry, West Springfield	99.33 99.25	.09 .26	— .30	— .19	81 85-6	* 4/36
117	Red Clover..... Community Feed Stores, East Longmeadow	99.25 99.33	.38 .34	— .17	— .16	90 90-2	* 6/36

334	Medium Red Clover. J. H. Sibley & Son, Ware	L. F.	98.50 98.81	.50 .43	.50 .29	.47 7-2	90 7-2	* 6/36
SWEET CLOVER								
124	ALLIED SEED CO., INC. Philadelphia, Pa. White Blossom Sweet Clover, Lot B 3120. Sunshine Feed Store, Greenfield	L. F.	99.75 99.31W 0.59Y	.11 .02	.12 .08	.02 .00	88 10 45 3	* 7/36
Total Melilotus Spp.								
181	W. F. COBB CO., Franklin White Blossom Sweet Clover. W. F. Cobb Co., Franklin	L. F.	99.54 98.90W .44Y	.06 .05	.30 .12	.10 .49	87 78 8	11/35 5/36
Total Melilotus Spp.								
385	CRAYER, DICKINSON SEED CO., Buffalo, N. Y. Yellow Blossom Sweet Clover. Berkshire Coal & Grain Co., North Adams	L. F.	99.20 99.55	.02 .04	— .19	— .22	80-9 46-10	* 7/36
132	EASTERN STATES FARMERS' EXCHANGE, West Springfield White Blossom Sweet Clover, Unscarified. Greenfield Farmers' Exchange, Greenfield	L. F.	98.75 91.39W .16Y	.30 .11	.90 8.34	.06 .00	75-15 15-75	* 7/36
Total Melilotus Spp.								
1008	ROSS BROS. CO., Worcester White Blossom Sweet Clover. Ross Bros. Co., Worcester	L. F.	99.60 98.33W 1.43Y	.20 .14	— .08	— .02	92 84 7	* 7/36
Total Melilotus Spp.								
1019	WHITE CLOVER ALBERT DICKINSON SEED CO., Chicago, Ill. White Clover, Lot No. 26-45. Fitchburg Hardware Co., Fitchburg	L. F.	98.40 97.60	.10 .65	— 1.60	— .15	60 60-26	* 5/36
1023	White Clover. Fitchburg Hardware Co., Fitchburg	L. F.	98.4 98.35	.10 .18	— .23	— 1.24	60 77-6	* 6/36
198	THOMAS W. EMERSON CO., Boston White Clover. Cobb, Bates & Yerxa, Taunton	L. F.	98.97 98.76	.40 .34	— .43	— .47	84 85-7	* 4/36

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Inspected and Place Collected	Pure Seed %	Winged Seed %	Mean Moisture %	Water Content Seed %	Germination %	Days to Test
WHITE CLOVER—Continued							
1611	White Clover Edward Adams, Inc., Worcester	92 57 93 12	—	12	—	52 32 24	1 30 4 26
1647	White Clover W. M. Lee, Chicago	92 97 92 57	—	16	—	54 72 13	* 6 30
52	WILLIAM C. McALETT & Co., Baltimore, Md. White Clover H. C. Puffer Co., Springfield	— 96 62	* 55	— 62	2 10	— 10	* 5 36
45	WHITNEY-ROCKWELL FIELD CO., Bohalia, N. Y. White Clover J. Russell & Co., Buffalo	97 25 92 14	50 45	— 22	— 16	73 5 73 11	* 7 34
72	White Clover Foster-Parrat, Northampton	92 96 97 96	55 37	— 40	— 27	62 26	* 4 26
55	White Clover George Meche Co., Springfield	92 50 92 25	78 68	— 63	— 44	73 17 74 13	* 5 26
120	White Clover Continuity Seed Union, East Longmeadow	92 50 92 62	74 49	— 20	— 69	73 17 80 7	* 6 26
162	White Clover (2) W. K. Williams & Son, Walpole	97 44 97 41	50 48	— 29	1 32	75 9 92	3 24 7 26
223	White Clover Berkshire Coal & Grain Co., North Adams	92 25 —	34 —	35 —	96	75 21	* 5 26
422	White Clover Davis Hardware Co., Gardiner	97 64 —	* —	19 —	— 56	—	* 6 26
2022	White Clover Northboro Hardware Co., Northboro	92 50 92 26	72 74	— —	— 48	73 17 57 20	* 5 26
FIELD CORN							
140	BABLER & PENNETT CO., Albany, N. Y. Field Corn (6) E. J. Adams & Son, Great Barrington	99 92 —	— 60	— 60	— 60	— 82 12	* 5 26

90	CRAVER, DICKINSON CO., Buffalo, N. Y. Leaming H. C. Puffer Co., Springfield	L. F.	99 00 99 95	— —	— —	— —	90 84 R	" 5 35
126	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Field Corn (6) Sunshine Feed Store, Greenfield	L. F.	98 00 99 95	— —	— —	— —	90 77 R	" 5 35
130	Flint Greenfield Farmers' Exchange, Greenfield	L. F.	98 00 99 90	— —	— —	— —	88 95	" 5 35
1017	T. W. WOOD & SONS, Richmond, Va. Eureka W. N. Potter's Sons, Gardner	L. F.	" 100 00	— —	— —	— —	" 90 R	" 5 35
65	S. D. WOODRUFF & SONS, Orange, Conn. Silo Corn Ensilage (6) W. N. Potter's Sons, Northampton	L. F.	100 00 99 98	— —	— —	— —	80 79	2 35 5 35
1049	Woodruff's Select Beauty Wallace Grain Co., Clinton	L. F.	100 00 99 95	— —	— —	— —	88 86 R	2 35 5 35
FESCUES								
127	ALLIED SEED CO. INC., Philadelphia, Pa. Meadow Fescue Sunshine Feed Store, Greenfield	L. F.	97 11 97 86	.91 .91	1 94 1 03	— —	70 33 R	2 35 5 35
1003	ROSS BROS. CO., Worcester Chewing's Fescue Ross Bros. Co., Worcester	L. F.	98 30 98 99	.05 10	— 85	— 95	90 99	" 5 35
1009	Meadow Fescue Ross Bros. Co., Worcester	L. F.	97 00 96 87	1 75 1 74	— 1 37	— 92	90 92	" 5 35
MANGELS								
1088	THOMAS W. EMERSON CO., Boston Mangel Wurtzel Beet George C. Winter Co., Southbridge	L. F.	" 99 30	" .03	— 44	— —	" 74 R	" 5 35
332	CHARLES C. HART SEED CO., Wethersfield, Conn. Giant Long Red Mangel Carr Hardware Co., Pittsfield	L. F.	" 99 45	— .09	— 52	— —	" 75 R	" 4 35
278	Mangel Beet, Red Giant Grange Store, Amherst	L. F.	" 98 40	" .06	— 1 51	— —	" 53	" 4 35

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test
MANGELS — Concluded							
319	JEROME B. RICE SEED CO., Cambridge, N. Y. Mangel Beet..... Clark Hardware Co., Greenfield	* 99.04	* .01	— .89	— .06	* 77(R)	* 4/36
2004	F. H. WOODRUFF & SONS, Milford, Conn. Mammoth Long Red Mangel..... A. S. Tucker, Warren	* 99.78	— .00	— .22	— .00	* 75(R)	* 6/36
438	S. D. WOODRUFF & SONS, Orange, Conn. Red Mangel Beet..... Farm Service Stores, Leominster	* 98.68	* .08	— 1.18	— .06	* 70(R)	* 5/36
GOLDEN MILLET							
180	W. F. COBB CO., Franklin Golden Millet..... W. F. Cobb Co., Franklin	99.14 99.38	.60 .25	.26 .37	.00 .00	85 79	3/36 6/36
1007	ROSS BROS. CO., Worcester Golden Millet..... Ross Bros. Co., Worcester	99.65 99.69	.05 .12	— .17	— .02	92 88	* 5/36
HUNGARIAN MILLET							
123	ALLIED SEED CO. INC., Philadelphia, Pa. Hungarian Millet..... Sunshine Feed Store, Greenfield	* 99.10	* .50	— .29	— .11	* 86	* 7/36
1014	CRAVER, DICKINSON SEED CO., Buffalo, N. Y. Hungarian Millet..... W. N. Potter's Sons, Gardner	99.05 99.23	.75 .58	— .15	— .04	85 72(R)	4/35 7/36
107	THOMAS W. EMERSON CO., Boston Hungarian Millet..... C. A. Smith, Ludlow	98.62 98.28	.70 .75	— .88	— .09	88 82	* 6/36
1059	Hungarian Millet..... Taft Bros., Uxbridge	99.38 99.61	* .29	— .10	— .00	90 91	3/36 7/36
113	N. WERTHEIMER & SONS, Ligonier, Ind. Hungarian Millet..... Cutler Coal & Grain Co., Palmer	99.44 99.11	.28 .55	.24 .28	.04 .06	83 77	* 7/36

1051	Hungarian Millet..... Wallace Grain Co., Clinton	L. F.	99.46 99.39	.32 .44	.22 .11	— .06	85 79(R)	12/35 7/36
131	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Hungarian Millet..... Greenfield Farmers' Exchange, Greenfield	L. F.	99.00 99.44	.39 .44	— .12	— .00	87 84	* 6/36
164	Hungarian Millet..... W. K. Gilmore & Son, Walpole	L. F.	98.97 98.22	.69 .62	— 1.16	— .00	90 81(R)	2/36 7/36
JAPANESE MILLET								
89	CRAVER, DICKINSON SEED CO., Buffalo, N. Y. Japanese Millet..... H. C. Puffer Co., Springfield	L. F.	98.17 98.58	1.75 1.25	— .17	— .00	88 89	* 5/36
1061	THOMAS W. EMERSON CO., Boston Japanese Millet..... Taft Bros., Uxbridge	L. F.	99.67 99.75	* .08	— .17	— .00	96 84(R)	1/36 6/36
1015	NUSBAUM SEED CO., Stepney, Conn. Japanese Millet..... W. N. Potter's Sons, Gardner	L. F.	98.00 99.13	.67 .73	— .14	— .00	95 86(R)	1/36 5/36
67	N. WERTHEIMER & SONS, Ligonier, Ind. Japanese Millet..... W. N. Potter's Sons, Northampton	L. F.	98.00 94.29	1.42 5.55	— .14	— .02	93 88	*/36 5/36
115	Japanese Millet..... Cutler Coal & Grain Co., Palmer	L. F.	98.92 98.64	1.06 1.27	.02 .09	— .00	91 88	* 5/36
288	Japanese Millet..... Smith Feed Co., Westfield	L. F.	98.40 97.92	.76 .70	.76 1.36	.08 .02	88 78(R)	* 5/36
64	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Japanese Millet..... Charles E. Terry, West Springfield	L. F.	98.06 98.43	1.20 1.38	— .18	— .01	90 93	2/36 5/36
1050	Japanese Millet..... Wallace Grain Co., Clinton	L. F.	96.64 97.33	2.37 2.29	— .38	— .00	88 82	5/35 5/36
OATS								
396	BARBER & BENNETT CO., Albany N. Y. Oats (6)..... C. A. Pierce, Hinsdale	L. F.	95.60 96.76	.80 .92	.20 .58	3.40 1.74	95 93	3/36 5/36



## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
OATS — Concluded							
COMMUNITY FEED STORES, East Longmeadow							
121	Oats (6).....	97.89	.02	—	—	94	*
	(2 Quack Grass and 1 Wild Mustard per oz.) (1)	97.47	.31	.39	1.83	94	5/36
	Community Feed Stores, East Longmeadow						
CHARLES M. COX CO., Boston							
167	Seed Oats, 38-40 (Recleaned) (6).....	*	*	—	—	*	*
	W. K. Gilmore & Son, Walpole	96.31	.62	.84	2.23	95	5/36
Oats (6) (2 Wild Mustard per oz.) (1)							
291	Smith Feed Co., Westfield	96.19	.25	.83	2.73	91	5/36
EASTERN STATES FARMERS' EXCHANGE, West Springfield							
133	Oats (6).....	98.00	.05	.96	1.00	90	*
	Greenfield Farmers' Exchange, Greenfield	99.05	.14	.33	.48	93	5/36
ROSS BROS. CO., Worcester							
1006	Swedish Oats.....	*	*	—	—	*	*
	Ross Bros. Co., Worcester	96.10	1.02	1.15	1.73	87(R)	5/36
WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.							
208	Oats, Lot No. 8072 (6).....	99.50	.10	—	—	96	*
	A. E. Wordell, New Bedford	99.29	.08	.07	.56	97	4/36
ORCHARD GRASS							
387	Whitney-Eckstein Seed Co., Buffalo, N. Y.	89.72	.98	—	—	84	*
	Orchard Grass.....	90.39	.65	8.31	.65	77(R)	6/36
	Berkshire Coal & Grain Co., North Adams						
CANADA FIELD PEAS							
1068	Jerome B. Rice Seed Co., Cambridge, N. Y.	*	—	—	—	*	*
	Canada Field Peas.....	99.95	.00	.05	.00	19	5/36
	George E. Doane, Middleboro						
403	Ross Bros. Co., Worcester	99.00	—	—	—	95	*
	Canada Field Peas.....	99.90	.00	.00	.00	71(R)	6/36
	Ross Bros. Co., Worcester						

1016	N. WERTHEIMER & SONS, Buffalo, N. Y. Canada Field Peas..... W. N. Potter's Sons, Gardner	L. F.	99 00 99.98	— .00	— .00	90 88	1/36 5/36
390	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Canada Field Peas..... L. P. Adams, Dalton	L. F.	* 99.95	— .00	— .00	* 91	* 5/36
RAPE							
1022	BARBER & BENNETT CO., Albany, N. Y. Dwarf Essex Rape, Lot No. 1214..... Fitchburg Hardware Co., Fitchburg	L. F.	99 76 99.84	— .08	— .00	89 85	* 6/36
1052	ROSS BROS., CO., Worcester Rape (6)..... Hamilton Hardware Co., Clinton	L. F.	* 99 68	* .14	— .18	* 94	* 6/36
386	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Rape (6)..... Berkshire Coal & Grain Co., North Adams	L. F.	* 99.50	* .03	— .47	* 10(R)	* 7/36
1025	S. D. WOODRUFF & SONS, Orange, Conn. Rape* (Brassica sp., some form of Turnip) W. E. Aubuchon & Co., Fitchburg	L. F.	* 99.49	* .02	— .49	* 86	* 6/36
204	WHOLESALE UNKNOWN Fancy Rape (6)..... Cobb, Bates & Yerxa, Taunton	L. F.	* 99.69	* .11	— .20	* 65	* 7/36
REDTOP							
66	COMSTOCK-FERRE CO., Wethersfield, Conn. Redtop, Clean..... Foster-Farrar, Northampton	L. F.	98.00 98.23	.30 .25	— 1.50	94 92	* 6/36
91	ALBERT DICKINSON CO., Chicago, Ill. Fancy Redtop..... H. C. Puffer Co., Springfield	L. F.	91.50 92.96	.90 .72	— 6.20	95 91	* 6/36
92	Redtop..... H. C. Puffer Co., Springfield	L. F.	99.65 90.39	.05 .78	— 8.53	94 91	* 6/36
393	CRAYER, DICKINSON CO., Buffalo, N. Y. Redtop..... C. A. Pierce, Hinsdale	L. F.	95.40 94.28	.60 .89	— 4.83	91 86	* 6/36

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
REDTOP — Concluded							
80	DOUGHTEN SEED CO., Jersey City, N. J. Redtop..... Grange Store, Amherst	* 93.20	* 2.40	— 4.30	— .10	* 84	* 6/36
129	EASTERN STATES FARMERS' EXCHANGE, West Springfield Redtop..... Greenfield Farmers' Exchange, Greenfield	* 92.31	* 1.04	— 6.58	— .07	* 88	* 7/36
36	THOMAS W. EMERSON CO., Boston Redtop, B. S..... Winer Bros., Beverly	97.24 89.26	* .58	— 9.83	— .33	92 80(R)	*35 7/36
103	Redtop..... C. A. Smith, Ludlow	97.00 91.28	.13 .72	— 5.09	— 2.91	92 90	* 6/36
1063	Redtop..... Taft Bros., Uxbridge	95.34 97.27	.40 .15	— 2.28	— .30	90.5 92	*35 6/36
96	STANFORD SEED CO., Buffalo, N. Y. Redtop..... George Methe Co., Springfield	90.35 90.71	.85 .29	— 6.43	— 2.57	92 80(R)	* 7/36
296	Redtop..... O. B. Parks Co., Westfield	90.35 90.50	.85 .80	— 5.30	— 3.40	92 93	* 6/36
52	N. WERTHEIMER & SONS, Ligonier, Ind. Redtop..... W. N. Potter's Sons, Northampton	92.63 90.84	1.41 .23	— 7.16	— 1.77	94 88(R)	*36 7/36
111	Redtop..... Outler Coal & Grain Co., Palmer	92.63 92.79	.40 .36	5.56 5.51	1.41 1.34	94 94	* 6/36
287	Redtop..... Smith Feed Co., Westfield	95.89 94.67	.18 .81	3.84 4.49	.09 .03	83 71	* 6/36
1048	Redtop..... Wallace Grain Co., Clinton	92.63 90.12	.40 .42	5.56 7.84	1.41 1.62	94 86(R)	1/36 7/36
85	WHITNEY-ECKSTEIN CO., Buffalo, N. Y. Redtop..... Carlisle Hardware Co., Springfield	92.60 92.64	.90 .78	— 6.09	— .49	88 82	* 7/36

118 Pan American Redtop ..... L.  
Community Feed Stores, East Longmeadow ..... F.  
ROUGH STALKED MEADOW GRASS

1004 ROSS BROS. CO., Worcester ..... L.  
Rough Stalked Meadow Grass ..... F.  
Ross Bros. Co., Worcester ..... 94.00  
..... 91.08  
..... 7.77  
..... .31  
..... 88  
..... 81  
..... \*..... 7/36

RYE

179 W. F. COBB CO., Franklin ..... L.  
Spring Rye, Canada R. S. .... F.  
W. F. Cobb Co., Franklin ..... 99.07  
..... 99.56  
..... .06  
..... .05  
..... .30  
..... 96  
..... 82(R)  
..... 1/36  
..... 5/36

1020 BARBER & BENNETT CO., Albany, N. Y.  
Winter Rye-Rosen. .... L.  
Fitchburg Hardware Co., Fitchburg ..... F.  
..... 97.00  
..... 97.33  
..... .03  
..... .02  
..... 2.02  
..... .63  
..... 97  
..... 82(R)  
..... \*/35  
..... 5/36

1055 ROSS BROS. CO., Worcester ..... L.  
Rye (6) ..... F.  
Ross Bros. Co., Worcester ..... 97.24  
..... \*  
..... 97.24  
..... 2.58  
..... .17  
..... 90  
..... \*..... 5/36

1056 Winter Rye ..... L.  
Ross Bros. Co., Worcester ..... F.  
..... 98.49  
..... \*  
..... .60  
..... .90  
..... 84  
..... \*..... 5/36

1057 Spring Rye ..... L.  
Wallace Grain Co., Clinton ..... F.  
..... 97.60  
..... 96.98  
..... .03  
..... .12  
..... 2.66  
..... .24  
..... 90  
..... 85  
..... 7/35  
..... 5/36

RYEGRASS

1012 THOMAS W. EMERSON CO., Boston ..... L.  
English Perennial Ryegrass. .... F.  
Elwood Adams Inc., Worcester ..... 94.66  
..... 93.55  
..... .24  
..... 7.00  
..... 90  
..... 96  
..... 1/36  
..... 5/36

SUDAN GRASS

294 THOMAS W. EMERSON CO., Boston ..... L.  
Sudan Grass ..... F.  
O. B. Parks Co., Westfield ..... 98.84  
..... \*  
..... 1.15  
..... .00  
..... 64(R)  
..... \*..... 6/36

SUNFLOWER

166 WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y.  
Sunflower ..... L.  
W. K. Gilmore & Son, Walpole ..... F.  
..... 98.58  
..... \*  
..... 1.42  
..... .00  
..... 70  
..... \*/35  
..... 5/36

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test
SUNFLOWER — Concluded							
337	Sunflower J. B. Sibley & Son, Ware	* 98.71	— .00	— 1.29	— .00	* 81	* 5/36
323	F. H. WOODRUFF & SONS, Milford, Conn. Sunflower F. I. Webster Co., Turners Falls	* 99.78	— .00	— .20	— .02	* 72	* 6/36
TIMOTHY							
38	THOMAS W. EMERSON CO., Boston Timothy (2) L. E. Smith Co., Gloucester	98.25 99.54	.15 .02	— .40	— .04	90.25 73	*/34 6/36
199	Timothy Cobb, Bates & Yerxa, Taunton	99.60 99.13	* .05	.66	.16	90 87	* 4/36
1062	Bay State Timothy Taft Bros., Uxbridge	99.60 99.35	* .05	— .50	— .10	90 95	*/35 6/36
56	DOUGHTEN SEED CO., Jersey City, N. J. Timothy, Freedom Prentiss Brooks Co., Holyoke	99.75 99.70	.05 .05	— .15	— .10	90 95	* 4/36
40	DURYEA SEED CO., New York City Timothy, 1240 Frank H. Whitaker, East Longmeadow	99.00 99.62	.10 .05	— .25	— .08	90 93	8/35 4/36
94	THE PHILADELPHIA SEED CO., Philadelphia, Pa. Timothy George Methe Co., Springfield	99.60 99.24	.05 .03	.30 .23	.05 .50	93 93	* 7/36
30	WILLIAM G. SCARLETT & CO., Baltimore, Md. Timothy, 2100 Franklin Hardware Co., North Attleboro	94.00 94.07	1.80 1.61	— 3.74	— .58	80 70(R)	* 4/36
104	STANFORD SEED CO., Buffalo, N. Y. Timothy C. A. Smith, Ludlow	99.64 99.66	.05 .04	— .15	— .15	93 95	* 6/36

110	Timothy R. E. Faulkner, Palmer	L. F.	90.41 99.61	1.91 .04	— .29	— .06	80 95	* 7/36
70	N. WERTHEIMER & SONS, Ligonier, Ind. Timothy W. N. Potter's Sons, Northampton	L. F.	99.83 99.78	.02 .02	.15 .15	— .05	92 93	* 4/36
98	Timothy Smith Feed Co., Westfield	L. F.	99.50 99.83	.15 .03	.35 .10	— .04	91 94	* 7/36
114	Timothy Cutler Coal & Grain Co., Palmer	L. F.	99.75 99.75	.05 .06	.15 .17	.05 .02	93 93	* 6/36
1018	Timothy W. N. Potter's Sons, Gardner	L. F.	99.83 99.64	.02 .04	.13 .24	.02 .08	92 95	1/36 7/36
51	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Pan American Timothy J. Russell & Co., Holyoke	L. F.	99.60 99.68	.10 .11	— .12	— .09	92 94	* 4/36
84	Timothy Carlisle Hardware Co., Springfield	L. F.	99.50 97.92	.10 .06	— .33	— 1.69	88 96	* 6/36
119	Timothy Community Feed Stores, East Longmeadow	L. F.	99.60 99.71	.10 .09	— .18	— .02	92 95	* 5/36
MIXTURES								
128	EASTERN STATES FARMERS' EXCHANGE, West Springfield Red and Alsike Clover Mixture (Medium Red Clover)* Greenfield Farmers' Exchange, Greenfield	L. F.	* 94.47R 5.10A	* .07	— .32	— .04	* 84-6R 81-15A	* 6/36
68	N. WERTHEIMER & SONS, Ligonier, Ind. Alsike and White Clover Mixture (Alsike Clover)* W. N. Potter's Sons, Northampton	L. F.	* 91.06A 7.83W	* .50	— .26	— .35	* 76-16A 54-42W	* 4/36

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES					
125	ALLIED SEED CO. INC., Philadelphia, Pa. Shady Lawn Mixture* Sunshine Feed Store, Greenfield. Redtop..... Rough Stalked Meadow Grass..... Chewings Fescue..... Kentucky Bluegrass..... Domestic Ryegrass..... White Clover.....	— 93.19 L. F. 35.02% 23.70 14.62 9.47 6.69 3.69	* .27 L. F. 35.02% 23.70 14.62 9.47 6.69 3.69	* 6.31 L. F. 35.02% 23.70 14.62 9.47 6.69 3.69	— .23 L. F. 35.02% 23.70 14.62 9.47 6.69 3.69
338	APOTHECARIES HALL CO., Waterbury, Conn. Lawn Mixture..... Domestic Ryegrass 45%, Fancy Redtop 25%, White Clover 5%, Meadow Fescue 5% (4) Kentucky Bluegrass 20% Ford & Parker, Dalton..... Domestic Ryegrass..... Redtop..... Kentucky Bluegrass (5)..... White Clover (5).....	— L. L. F. 57.84% 17.21 2.50 1.55	— L. L. F. 57.84% 17.21 2.50 1.55	— Less than 1.00 20.17 20.17	— Less than 1.00 .25 .25
57	BARBER & BENNETT CO., Albany, N. Y. Shady Spot Lawn Mixture..... Poa trivialis 27.6%, Kentucky Bluegrass 32%, Redtop 19.6%, Domestic Ryegrass 9.8% Prenitiss Brooks Co., Holyoke..... Rough Stalked Meadow Grass..... Kentucky Bluegrass..... Redtop..... Domestic Ryegrass.....	— L. F. 33.10% 25.90 22.70 8.40	— L. F. 33.10% 25.90 22.70 8.40	— 10.20 8.60 8.60	— — .80 .80
176	BIGELOW-DOWSE CO., South Boston Grass Mixture* C. K. Houghton, Littleton..... Redtop..... Domestic Ryegrass..... Kentucky Bluegrass..... Chewings Fescue..... White Clover.....	— L. F. 37.52% 23.81 13.71 6.91 3.17	* 1.08 L. F. 37.52% 23.81 13.71 6.91 3.17	* 12.87 L. F. 37.52% 23.81 13.71 6.91 3.17	— 93 L. F. 37.52% 23.81 13.71 6.91 3.17

168	JOSEPH BRECK & SONS INC., Boston					
	Good Trade Grass Seed Mixture.....	L.				
	Redtop, Timothy, White Clover, Domestic Ryegrass.....			—	.80	7.26
	Vanderhoof Hardware Co., Concord.....	F.		92.27	.35	6.68
	Domestic Ryegrass.....					.70
75	Timothy.....					
	Redtop.....					
	White Clover (5).....					
	COMSTOCK-FERRE CO., Wethersfield, Conn.					
	Lawn Grass Mixture.....	L.		—	*	—
47	Redtop, Kentucky Bluegrass, Domestic Ryegrass, Chewing's Fescue.....					
	Foster-Farrar, Northampton.....	F.		94.12	.48	5.20
	Agrostis spp. (Redtop and Colonial Bent (3).....					.20
	Kentucky Bluegrass.....					
	Domestic Ryegrass.....					
47	Chewing's Fescue.....					
	White Clover (3).....					
	EASTERN STATES FARMERS' EXCHANGE, INC., West Springfield					
	Grass Mixture, No. 2 Hayland.....	L.		98.40	.40	—
	Medium Red Clover 24%, Alsike Clover 16%, Timothy 40%, Redtop 20%.....					
78	Eastern States Farmers' Exchange, Inc., West Springfield.....	F.		99.30	.22	.04
	Timothy.....					
	Red Clover.....					
	Alsike Clover.....					
	Redtop.....					
108	THOMAS W. EMERSON CO., Boston					
	Velva Turf Lawn Seed Mixture.....	L.		87.55	.70	11.75
	Fancy Kentucky Bluegrass, New Zealand Chewing's Fescue, Fancy Redtop, White Clover.....					
	Grange Store, Amherst.....	F.		87.70	.60	10.20
	Redtop.....					1.50
78	Kentucky Bluegrass.....					
	White Clover.....					
	Chewing's Fescue.....					
	R. E. FAULKNER, Palmer					
	Lawn Mixture.....	L.		—	*	—
108	Redtop, White Clover, Domestic Ryegrass.....					
	R. E. Faulkner, Palmer.....	F.		92.67	.27	7.06
	Redtop.....					.00
	Timothy (3).....					
	Kentucky Bluegrass (3).....					
108	Domestic Ryegrass.....					
	White Clover (3).....					





77	Green Park Lawn Seed Unhulled Redtop 25%, Fancy Redtop 25%, Domestic Ryegrass 20%, Fancy Timothy 15%, Kentucky Bluegrass 13%, White Clover 1%	L.	85.50	.70	*
	Federal Supply Co., Northampton	F.	85.54	1 00	13 34
	Redtop.....		41.15 <sup>c</sup>		
	Domestic Ryegrass.....		17.69		
	Timothy.....		15.98		
	Kentucky Bluegrass.....		8.42		
	White Clover.....		2 30		
136	Lawn Grass, Shadow Mixture Unhulled Redtop 25%, Fancy Redtop 25%, Domestic Ryegrass 20%, Rough-Stalked Meadow Grass 15%, Kentucky Bluegrass 15%	L.	85.90	8 00	13 30
	Carr Hardware Co., Pittsfield.....	F.	83.88	85	14 38
	Redtop.....		36.43 <sup>c</sup>		
	Domestic Ryegrass.....		24.81		
	Rough-Stalked Meadow Grass.....		12.39		
	Kentucky Bluegrass.....		10 25		
138	Lawn Grass Fancy Redtop, Kentucky Bluegrass, Domestic Ryegrass, Timothy, White Clover, 2% Carr Hardware Co., Pittsfield.....	L.	77 20	.70	22 10
	Agrostis spp. (Redtop & Colonial Bent)	F.	87.12	.74	12 14
	Kentucky Bluegrass.....		48.19 <sup>c</sup>		
	Domestic Ryegrass.....		20 15		
	White Clover.....		16.12		
	Timothy (5).....		2.52		
			.14		
235	LAKE SHORE SEED CO., Dunkirk, N. Y. Grass Mixture Redtop, White Clover, Timothy, Bluegrass (6), Ryegrass (5) (6)	L.	—	*	*
	Rosindale Hardware Co., Rosindale.....	F.	51.92	1.04	46.83
	Redtop.....		27.71 <sup>c</sup>		
	Timothy.....		9.66		
	Domestic Ryegrass.....		7.56		
	White Clover.....		6.67		
	Canada Bluegrass (5).....		.25		
	Kentucky Bluegrass (5).....		.08		
2204	Mixed Lawn Grass Seed Redtop, White Clover, Timothy, Bluegrass (6), Ryegrass (6)	L.	—	*	*
	C. F. Pease, West Warren.....	F.	55.70	1.60	41 60
	Redtop.....		17.80 <sup>c</sup>		
	Timothy.....		16.60		
	Domestic Ryegrass.....		8.80		
	White Clover.....		8.40		
	Kentucky Bluegrass (5).....		3.70		
	Canada Bluegrass (5).....		.40		

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES — Continued					
2205	Mixed Lawn Grass Seed Redtop, White Clover, Timothy, Bluegrass (6), Ryegrass (6) P. A. Richards, Spencer Timothy.....L. Redtop.....F. White Clover.....19.00 % Domestic Ryegrass.....18.20 Kentucky Bluegrass.....9.50 Canada Bluegrass (6).....6.30 .....4.30 ......40	— 57.70	* 1.70	* 40.50	— .10
44	PAGE SEED CO., Greene, N. Y. Grass Mixture.....L. Kentucky Bluegrass, White Clover, Meadow Fescue, Redtop, Rough-Stalked Meadow Grass, Perennial Ryegrass, Timothy Frank Whitaker, East Longmeadow Redtop.....F. Kentucky Bluegrass.....29.90 % Rough Stalked Meadow Grass.....10.91 Timothy.....18.12 Perennial Ryegrass.....14.04 White Clover.....12.43 Meadow Fescue (5).....5.31 .....3.89	— 94.60	* .38	* 4.45	— .57
343	Lawn Mixture.....L. Perennial Ryegrass 10%, Redtop 32%, Kentucky Bluegrass 16%, Rough-Stalked Meadow Grass 13%, Timothy 12%, Meadow Fescue 5%, White Clover 5% J. F. Robinson & Co., Ware.....F. Agrostis spp. (Colonial Bent (3) and Redtop).....34.60 % Kentucky Bluegrass.....16.00 Timothy.....13.80 Rough-Stalked Meadow Grass.....9.60 Perennial Ryegrass.....6.60 White Clover.....5.30 Meadow Fescue.....4.10 Red Fescue (3).....2.90	93.40 92.90	.40 .40	6.20 6.50	— .20

	PEDIGREED SEED CO., INC., New York City	L.	Less than 1 c <sup>t</sup> .	
31	Century Park Lawn Mixture. Redtop, Domestic Ryegrass, Timothy, White Clover 2 %, Kentucky Bluegrass 4 % Franklin Hardware Co., North Attleboro. Domestic Ryegrass. Timothy..... Redtop..... Kentucky Bluegrass..... White Clover.....	L. F.  30.57 c <sup>t</sup> . 27.65 8.57 3.00 3.31	.63 73.70 24.24 17.00	1.43
214	RADWAY McCULLOUGH SEEDS, INC., New York City Choice White Clover*. Pure White Clover 38 %, Alsike Clover 38 %, Timothy 9 % Taunton Hardware Co., Taunton. White Clover..... Alsike Clover..... Timothy.....	L.  F.  46.90 c <sup>t</sup> . 34.65 9.05	— 90.60 3.45	3.00 3.55
25	RIDGEFIELD SEED CO., Ridgefield, N. J. Grass Mixture Boston's Prime Central Park Domestic Ryegrass, Timothy, Redtop, Kentucky Bluegrass, Meadow Fescue Taunton Hardware Co., Taunton. Timothy..... Redtop..... Domestic Ryegrass..... Kentucky Bluegrass..... Meadow Fescue.....	L.  F.  28.64 % 17.61 16.40 15.79 4.82	— 83.26 15.72	— 18
404	ROSS BROS. CO., Worcester Lawn Grass (Green Hill) Astoria Bent, Redtop, Kentucky Bluegrass, Domestic Ryegrass Ross Bros. Co., Worcester. Agrostis spp. (Redtop and Astoria Bent) Kentucky Bluegrass. Domestic Ryegrass.....	L.  F.  47.09 % 23.59 20.88	— 91.56 7.28	— .24
405	Worcester Lawn Seed. Redtop, Astoria Bent, Domestic Ryegrass, Kentucky Bluegrass, Cheiving's Fescue, 2.25 %, White Clover 2 % Ross Bros. Co., Worcester Agrostis spp. (Redtop and Astoria Bent). Domestic Ryegrass. Kentucky Bluegrass. Cheiving's Fescue. White Clover.....	L.  F.  39.00 % 25.70 17.70 2.30 2.20	— 86.90 8.60	— 4.00

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed % L.	Weed Seed % F.	Inert Matter % F.	Other Crop Seed % F.
SPECIAL SEED MIXTURES — Continued					
STANFORD SEED CO., Buffalo, N. Y.					
62	Lawn Mixture Kentucky Bluegrass, Fancy White Clover, Domestic Ryegrass, Fancy Redtop, Timothy Charles E. Terry, West Springfield	—	1 00	14 00	—
	Redtop	—	.61	11 84	.00
	Domestic Ryegrass	28.02%			
	Kentucky Bluegrass	21.79			
	Timothy	16.19			
	White Clover	14.77			
		6.78			
97	Liberty Lawn Mixture Kentucky Bluegrass, Fancy White Clover, Domestic Ryegrass, Fancy Redtop, Timothy George Methe Co., Springfield	—	1 00	14 00	—
	Redtop	—	1 36	16 41	17
	Kentucky Bluegrass	23.37%			
	Timothy	20.06			
	Domestic Ryegrass	15.84			
	White Clover	14.67			
	Chewing's Fescue (3)	6.82			
		1.30			
293	Regular Lawn Mixture Fancy Kentucky Bluegrass, Fancy White Clover, Fancy Redtop, Domestic Ryegrass, Timothy O. B. Parks Co., Westfield	—	1 00	14 50	—
	Redtop	—	.36	13 63	.25
	Domestic Ryegrass	29.70%			
	Timothy	18.29			
	Kentucky Bluegrass	17.55			
	White Clover	14.38			
		6.44			
1013	Liberty Lawn Seed (5001) Kentucky Bluegrass, Fancy White Clover, Domestic Ryegrass, Fancy Redtop, Timothy Waite Hardware Co., Worcester	—	1 00	14 00	—
	Redtop	—	.48	16 47	.05
	Kentucky Bluegrass	37.92%			
	Domestic Ryegrass	16.47			
	Timothy	14.82			
	White Clover	7.51			
		6.28			

71	N. WERTHEIMER & SONS, Ligonier, Ind. Lawn Seed Mixture, Lot 5001.....	L.	—	1.00	14.50	—
	Fancy Kentucky Bluegrass, Fancy White Clover, Domestic Ryegrass, Timothy.....					
	W. N. Potter's Sons, Northampton.....	F.	86.25	.50	12.93	.33
	Redtop.....	30.33%				
	Timothy.....	15.76				
	Domestic Ryegrass.....	15.47				
	Kentucky Bluegrass.....	13.27				
	White Clover.....	11.42				
289	Lawn Mixture.....	L.	—	.34	8.00	—
	Bluegrass (6) 45%, Redtop 45%, White Clover 5% Smith Feed Co., Westfield.....		86.50	.51	12.74	.25
	Redtop.....	30.78%				
	Domestic Ryegrass (3).....	18.63				
	Kentucky Bluegrass.....	15.35				
	Timothy (3).....	15.28				
	White Clover.....	6.46				
23	WHITNEY-ECKSTEIN SEED CO., Buffalo, N. Y. Greenvue Grass Mixture.....	L.	—	2.50	20.00	2.50
	Redtop, Canada Bluegrass, Timothy, Domestic Ryegrass Waldron Hardware Co., Taunton.....		71.75	1.22	21.84	5.19
	Domestic Ryegrass.....	F.				
	Timothy.....	42.07%				
	Canada Bluegrass.....	13.85				
	Redtop.....	7.93				
	Canada Bluegrass.....	7.90				
39	City Park Grass Mixture.....	L.	—	1.00	12.50	.50
	Kentucky Bluegrass, Redtop, Timothy, Domestic Ryegrass, White Clover 3% Wilson Supplies, Holyoke.....		81.38	1.17	15.33	2.12
	Domestic Ryegrass.....	F.				
	Redtop.....	33.41%				
	Canada Bluegrass (3).....	18.71				
	Timothy.....	13.65				
	White Clover.....	11.65				
	Kentucky Bluegrass (5).....	2.82				
	Canada Bluegrass.....	1.14				
58	Excelsior Lawn Mixture.....	L.	—	.70	10.00	2.70
	Fancy Kentucky Bluegrass 30%, New Zealand Chewings Fescue 5%, Fancy Redtop, 45% Fancy White Clover 7% Prentiss Brooks Co., Holyoke.....					
	Redtop.....	F.	86.50	1.00	12.15	.35
	Kentucky Bluegrass.....	49.30%				
	White Clover.....	23.50				
	Chewings Fescue.....	8.00				
	Chewings Fescue.....	5.70				

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES — Continued					
82	Greenvue Lawn Mixture..... Kentucky Bluegrass 12%, Redtop 11%, Domestic Ryegrass 30%, Timothy 27%, White Clover 1% Mutual Plumbing & Heating Co., Amherst.	—	1.50	15.00	2.50
	Timothy..... Domestic Ryegrass..... Redtop..... Kentucky Bluegrass..... White Clover.....	77.28	1.93	18.12	2.67
87	Lawn Mixture* (3 Canada Thistle per oz.)..... Carlisle Hardware Co., Springfield	—	*	*	—
	Redtop..... Timothy..... Canada Bluegrass..... Domestic Ryegrass..... Kentucky Bluegrass..... White Clover.....	89.89	1.90	8.09	.11
165	Pan American Grass Mixture..... Fancy Kentucky Bluegrass, Redtop, Timothy, Domestic Ryegrass, White Clover W. K. Gilmore & Son, Watpole.	—	1.00	14.00	2.00
	Redtop..... Kentucky Bluegrass..... Domestic Ryegrass..... Timothy..... White Clover.....	86.15	.88	12.93	.04
200	Grass Mixture..... Kentucky Bluegrass, Redtop, Timothy Frank, the Seed Man, Springfield	—	*	*	—
	Timothy..... Redtop..... Kentucky Bluegrass.....	93.90	.44	5.56	.10

207	Quick Green Lawn Mixture Domestic Ryegrass, Timothy, White Clover 1%, Fancy Redtop A. E. Wordell, New Bedford	L. F.	— 83.77	2.00 .81	18.00 14.50	2.00 .92
	Domestic Ryegrass Timothy Redtop Kentucky Bluegrass (3) White Clover	46.75% 22.15 7.05 5.23 2.59				
335	Shady Spot Lawn Mixture Fancy Redtop, Kentucky Bluegrass, Canada Bluegrass, Domestic Ryegrass, Rough- Stalked Meadow Grass, Timothy J. B. Sibley & Son, Ware	L. F.	— 82.94	1.00 1.05	13.00 13.44	2.00 2.57
	Redtop Domestic Ryegrass Rough-Stalked Meadow Grass Timothy Kentucky Bluegrass Canada Bluegrass Meadow Fescue (3)	26.22% 22.21 10.20 9.25 6.30 4.38 4.38				
336	Boston Special Lawn Seed Fancy Redtop, Fancy Kentucky Bluegrass, Fancy White Clover, Timothy J. B. Sibley & Son, Ware	L. F.	84.00 84.72	Less than 1.00 1.79	12.50 13.34	— .15
	Redtop Domestic Ryegrass (3) Kentucky Bluegrass Timothy White Clover (5)	27.90% 23.92 15.31 13.78 3.81				
135	F. H. WOODRUFF & SONS, Milford, Conn. Lawn Mixture Kentucky Bluegrass 26.10%, Fancy Redtop 33.19%, Domestic Ryegrass 19.75%, Chewing's Fescue 9.80%, White Clover 2.75% Pierson Hardware Co., Pittsfield	L. F.	— 93.08	.73 .84	7.68 5.83	— .25
	Redtop Kentucky Bluegrass Domestic Ryegrass Chewing's Fescue White Clover	34.68% 24.22 20.35 8.79 5.04				



## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Mixture, Dealer, Place Collected, Name and Percentage of Ingredients in each Mixture	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %
SPECIAL SEED MIXTURES — Concluded					
139	Milford Green Lawn Grass.....	—	.73	7.68	—
	Kentucky Bluegrass 26.15%, Fancy Redtop 33.19%, Domestic Ryegrass 19.75%, Chewing's Fescue 9.80%, White Clover 2.75%	L.			
	E. J. Adams & Son, Great Barrington.....	F.	.25	6.19	.24
	Redtop.....	34.89%			
	Kentucky Bluegrass.....	27.17			
	Domestic Ryegrass.....	17.73			
	Chewing's Fescue.....	9.24			
	White Clover.....	4.29			
324	Evergreen Lawn Mixture.....	—	*	*	—
	Redtop 36.90%, Domestic Ryegrass 24.75%, Kentucky Bluegrass 12.30%, Chewing's Fescue 5.82%, White Clover 2.85%	L.			
	F. I. Webster Co., Turner Falls.....	F.	.80	11.30	.60
	Redtop.....	38.40%			
	Domestic Ryegrass.....	26.10			
	Kentucky Bluegrass.....	13.40			
	Chewing's Fescue.....	5.40			
	White Clover.....	4.00			

TABLE SHOWING GERMINATION OF SEEDS CONTAINED IN SPECIAL SEED MIXTURES

Number Tested	Name of Seed	GERMINATION PER CENT			Number Tested	Name of Seed	GERMINATION PER CENT		
		Lowest	Highest	Average			Lowest	Highest	Average
36	Redtop	30	97	74.66	3	Canada Bluegrass	64	78	69
36	Domestic Ryegrass	46	98	89.88	1	Orchard Grass	50	50	50
36	Kentucky Bluegrass	1	75	56.50	1	Perennial Ryegrass	47	47	47
35	White Clover	55-25	83-7	63.4-24.3	1	Red Fescue	16	16	16
28	Timothy	7	94	70.35		Agrostis spp.			
10	Chewing's Fescue	0	75	31.20	4	(Redtop and Colonial Bent)	80	87	83
6	Rough-Stalked Meadow Grass	33	82	55.33	2	(Redtop and Astoria Bent)	83	85	84
4	Meadow Fescue	48	92	72.5					

# 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
BEANS			
188	BARTLETT & DOW CO., Lowell Pencil Pod Black Wax..... Bartlett & Dow Co., Lowell	93	May
20	THOMAS W. EMERSON CO., Boston Pencil Pod Black Wax..... J. H. Ogden Hardware Co., New Bedford	99	April
26	Dwarf Horticultural..... Taunton Hardware Co., Taunton	98	April
184	Imperial Golden Wax..... C. B. Coburn, Lowell	81 (R)	June
326	Kentucky Wonder Wax..... Orange Hardware Co., Orange	91	April
415	Pencil Pod Black Bush..... Sherer's, Worcester	93	May
2077	Burpee's Stringless Green Pod..... The Adams Hardware Co., Northboro	92	June
2094	Kentucky Wonder..... W. M. Lee, Clinton	94	June
2095	Davis White Wax..... W. M. Lee, Clinton	38 (R)	May
43	FERRY-MORSE SEED CO., Detroit, Mich. Dwarf Horticultural..... Charles E. Gray & Sons, Gloucester	97	May
196	Kentucky Wonder Wax..... Cobb, Bates & Yerxa, Taunton	97	April
366	FREDONIA SEED CO., Fredonia, N. Y. Improved Golden Wax..... M. F. Packard, Worthington	83 (R)	May
19	CHARLES C. HART SEED CO., Wethersfield, Conn. French Horticultural..... Lepper Hardware Co., Attleboro	98	April
79	Kentucky Wonder..... Grange Store, Amherst	88	April
341	Kentucky Wonder Yellow Pole..... C. F. Paige & Co., Athol	95	April
356	Golden Wax..... Berkshire Hardware Co., Pittsfield	94	April
358	Bush Lima..... Berkshire Hardware Co., Pittsfield	74	May
359	Black Wax Pencil Pod..... Berkshire Hardware Co., Pittsfield	86 (R)	May
360	Yellow Field..... Carr Hardware Co., Pittsfield	98	May
434	Burpee's Bush Lima..... Leominster Hardware Co., Leominster	81 (R)	June
1085	Improved Golden Wax..... T. W. Pierce Hardware Co., Middleboro	90	June
223	LAKE SHORE SEED CO., Dunkirk, N. Y. Golden Wax..... Schofield Hardware Co., North Attleboro	70	April
445	Golden Wax (Bush)..... Leicester Paint & Hardware Co., Leicester	29	May
449	Black Wax or Butter..... P. A. Richards, Spencer	52	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
BEANS — Continued			
602	Kentucky Wonder Pole..... Vanderhoof Hardware Co., Concord	23	May
2013	Red Valentine..... C. F. Pease, Warren	64	May
2072	Tennessee Green Pod..... (Wholesaler's germination test — 75%) Leona Trespacz, West Warren	86	May
2076	Red Valentine..... Joseph Fortuna, West Warren	61	May
2106	Red Valentine..... Leo Genattacio, Worcester	69	May
2114	Bush Golden Wax..... J. Ferrare, Worcester	62	May
2127	Golden Wax..... John Soloperto, Worcester	32	May
2132	Black Wax or Butter..... Uxbridge Hardware Co., Uxbridge	48	June
2143	Golden Wax..... Tanguy's Market, Northbridge	62	June
2147	Red Valentine (Bush)..... Labontes Market, Northbridge	79	June
2178	Tennessee Green Pod..... Berzin Bros., Bridgewater	26	June
2181	Red Valentine (Bush)..... Berzin Bros., Bridgewater	33	June
2183	Black Wax or Butter..... John Canovaro Hardware Co., Kingston	52	June
2195	Golden Wax..... Home Grocery, Plymouth	56	June
D. LANDRETH SEED CO., Bristol, Pa.			
54	Pencil Pod Wax..... J. Russell & Co., Holyoke	92	April
412	Pencil Pod Wax..... Elwood Adams, Inc., Worcester	90	May
LEONARD SEED CO., Chicago, Ill.			
34	Burpee's Stringless Green Pod..... Winer Bros., Beverly	83 (R)	June
206	Wordell's Kidney Wax..... A. E. Wordell, New Bedford	90	April
330	Kentucky Wonder Wax..... A. E. Stewart, Athol	80 (R)	May
342	Dwarf Yellow Pod..... A. E. Stewart, Athol	74 (R)	June
NORTHRUP KING & CO., Minneapolis, Minn.			
2152	Pencil Pod Black Wax..... Pierce Hardware Co., Millbury	95	June
2154	Green Pod Bountiful (Bush)..... Pierce Hardware Co., Millbury	90	June
PAGE SEED CO., Greene, N. Y.			
398	Kentucky Wonder Wax..... Gatzke Hardware Co., Webster	95	June
402	Burpee's Stringless Green Pod..... Gatzke Hardware Co., Webster	95	June

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
BEANS — Concluded			
JEROME B. RICE SEED CO., Cambridge, N. Y.			
60	Round Pod Kidney Wax..... Wells Hardware Co., Holyoke	81 (R)	April
305	Golden Wax..... S. Allen's Sons, Greenfield	80 (R)	May
307	Yellow Eye..... Clark Hardware Co., Greenfield	87	April
317	Dwarf Green Pod..... Clark Hardware Co., Greenfield	90	April
373	Golden Wax..... Payne-Cummings Co., North Adams	80 (R)	May
374	Black Wax..... Payne-Cummings Co., North Adams	90	May
382	Burpee's Green Pod..... Burlingame & Darby Co., North Adams	84 (R)	May
1042	Pencil Pod Black Wax..... C. M. Rossier, Paxton	92	May
1071	Burpee's Stringless Green Pod..... George E. Doane, Middleboro	74	June
1072	Early Red Valentine..... George E. Doane, Middleboro	82	June
2097	Burpee's Stringless Green Pod..... Hamilton Hardware Co., Clinton	91	May
ROSS BROS. CO., Worcester			
407	Pencil Pod Black Wax..... Ross Bros. Co., Worcester	93	June
408	Dwarf Horticultural..... Ross Bros. Co., Worcester	93	May
2006	Kentucky Wonder Wax..... A. S. Tucker, Warren	94	May
F. H. WOODRUFF & SONS, Milford, Conn.			
203	Pencil Pod Black Wax..... Frank, the Seed Man, Springfield	82 (R)	April
321	Green Pod Stringless..... F. I. Webster Co., Turners Falls	90	April
347	Refugee Green..... Pierson Hardware Co., Pittsfield	83 (R)	May
1033	Golden Wax Beans..... Union Hardware Co., Fitchburg	95 (R)	June
1040	Improved Golden Wax..... Nellie Griffen's Store, Rutland	90	May
S. D. WOODRUFF & SONS, Orange, Conn.			
391	Long Yellow Six Weeks..... C. F. Glennon, Dalton	96	June
1027	Dwarf Horticultural..... W. E. Aubuchon Co. Inc., Fitchburg	94	June
1028	Burpee's Stringless Green Pod..... W. E. Aubuchon Co. Inc., Fitchburg	90	May
1029	Golden Wax..... W. E. Aubuchon Co. Inc., Fitchburg	88 (R)	May
2087	French Horticultural..... Farm Service Stores, West Berlin	98	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>BEETS</b>			
219	JOSEPH BRECK & SONS, INC., Boston Detroit Dark Red..... Schofield Hardware Co., North Attleboro	78 (R)	May
315	Egyptian..... Whitcomb & Carter, Beverly	69 (R)	June
238	THOMAS W. EMERSON CO., Boston Detroit Dark Red..... C. B. Coburn Co., Lowell	72 (R)	May
325	Early Blood..... Orange Hardware Co., Orange	75 (R)	April
2167	FRASER'S Wellesley Early Blood Turnip..... (Wholesaler's Germination test — 70%) Stone Hardware Co., Brockton	67	June
16	CHARLES C. HART SEED CO., Wethersfield, Conn. Crosby's Egyptian..... (Wholesaler's germination test — 75%) Lepper Hardware Co., Attleboro	77	April
241	Crosby's Egyptian..... (Wholesaler's germination test — 80+%) Smith Hardware Co., Lowell	73	May
268	Early Blood Turnip..... (Wholesaler's germination test — 70+%) Field Hardware Co., Chicopee	74	April
448	LAKE SHORE SEED CO., Dunkirk, N. Y. Detroit Dark Red..... Leicester Paint & Hardware Co., Leicester	82	May
453	Extra Early Egyptian..... P. D. Richards, Spencer	55	May
1067	Dewing's Improved Blood Red..... Sherman's Hardware & Furniture Co., Plymouth	46	June
1102	Dewing's Improved Blood Red..... Italian Grocery, Monson	78	June
2014	Dewing's Improved Blood Red..... Ledoux Market, Brimfield	75 (R)	June
2024	Detroit Dark Red..... George C. Winter Co., Southbridge	68 (R)	June
2064	Dewing's Improved Blood Red..... W. Gondek, Warren	54	May
2071	Extra Early Egyptian Blood Turnip..... Leona Trespacz, West Warren	72 (R)	June
2109	Dewing's Improved Blood Red..... Leo Genattacio, Worcester	71 (R)	May
2113	Extra Early Egyptian Blood..... J. Ferrare, Worcester	67 (R)	June
2126	Extra Early Egyptian Blood..... John Soloperto, Worcester	64	May
2145	Extra Early Egyptian Blood..... Tanguy's Market, Northbridge	58	June
2150	Detroit Dark Red..... Lebontes Market, Northbridge	67	June
2191	Dewing's Improved Blood Red..... John Canovaro Hardware Co., Kingston	68	June
2198	Dewing's Improved Blood Red..... Plymouth Rock Hardware Co., Plymouth	61	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>BEETS — Concluded</b>			
428	NORTHROP, KING & CO., Minneapolis, Minn. Extra Early Egyptian..... Davis Hardware Co., Gardner	82 (R)	June
400	PAGE SEED CO., Green, N. Y. Early Blood Turnip..... Gatzke Hardware Co., Webster	77 (R)	July
1037	Detroit Dark Red..... Quaboag Roofing & Hardware Co., West Brookfield	72 (R)	June
253	JEROME B. RICE SEED CO., Cambridge, N. Y. Crosby's Egyptian..... L. E. Andrews Co., Gloucester	75 (R)	May
266	Detroit Dark Red..... Field Hardware Co., Chicopee	65	April
2020	Detroit Dark Red..... Fred Parker, Fiskdale	70 (R)	June
231	ROSS BROS. CO., Worcester Edmond's Blood Turnip..... G. Arthur Skelton, Bedford	78 (R)	June
372	Crosby's Early Egyptian..... H. F. Packard, Cummington	73 (R)	May
406	Early Wonder..... Ross Bros. Co., Worcester	57 (R)	May
459	Crosby's Early Egyptian..... Harry R. Lamb, Brookfield	73 (R)	June
211	F. H. WOODRUFF & SONS, Milford, Conn. Crosby's Egyptian..... Frank, the Seed Man, Springfield	71 (R)	May
263	Detroit Dark Red..... Waldron Hardware Co., Taunton	87	April
<b>BROCCOLI</b>			
309	EASTERN STATES FARMERS' EXCHANGE, West Springfield Calabrese, (Green sprouting)..... (Wholesaler's germination test — 92%) Eastern States Farmers' Exchange, West Springfield	90	April
<b>BRUSSELS SPROUTS</b>			
353	F. H. WOODRUFF & SONS, Milford, Conn. Brussels Sprouts..... Pierson Hardware Co., Pittsfield	3 (R)	April
<b>CABBAGE</b>			
220	JOSEPH BRECK & SONS, Boston Drumhead Savoy..... Schofield Hardware Co., North Attleboro	82 (R)	April
310	EASTERN STATES FARMERS' EXCHANGE, West Springfield Copenhagen, Regular Golden Acre..... (Wholesaler's germination test — 82%) Eastern States Farmers' Exchange, West Springfield	79	April
259	THOMAS W. EMERSON CO., Boston Stone Mason..... L. E. Smith Co., Gloucester	48 (R)	May
1091	FERRY-MORSE SEED CO., Detroit, Mich. Late Flat Dutch (Ferry's Premium)..... Freeman's Variety Store, South Duxbury	90	June
2170	FRASER'S, Wellesley Early Wakefield..... (Wholesaler's germination test — 85%) Stone Hardware Co., Brockton	83	June

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>CABBAGE — Concluded</b>			
2051	FREDONIA SEED CO., Fredonia, N. Y. Danish Ball Head..... Chagnon's Market, Gilbertville	62 (R)	May
17	CHARLES C. HART SEED CO., Wethersfield, Conn. Premium Late Flat Dutch..... (Wholesaler's germination test — 90+%) Lepper Hardware Co., Attleboro	87	April
354	Copenhagen Market..... (Wholesaler's germination test — 80+%) Berkshire Hardware Co., Pittsfield	87	April
437	Drumhead Savoy..... (Wholesaler's germination test — 80+%) Leominster Hardware Co., Leominster	74 (R)	May
2039	HYGRADE SEED CO., Tuckahoe, N. Y. Savoy..... (Wholesaler's germination test — 90%) Perron's Hardware Co., Southbridge	96	May
603	LAKE SHORE SEED CO., Dunkirk, N. Y. Early Jersey Wakefield..... Vanderhoof Hardware Co., Concord	5	May
1080	Large Late Flat Dutch..... Begley Bros., Middleboro	25	June
2122	Hollander, or Danish Ball Head..... Italian Colonial Market, Worcester	87	May
2180	Chinese, or Pe Tsai Cinese..... Berzin Bros., Bridgewater	42	June
264	LEONARD SEED CO., Chicago, Ill. Copenhagen Market..... A. E. Wordell, New Bedford	63 (R)	April
218	PAGE SEED CO., Greene, N. Y. Danish Ball Head..... (Wholesaler's germination test — 80%) J. H. Ogden Hardware Co., New Bedford	86	April
234	ROSS BROS. CO., Worcester Danish Ball Head..... L. E. Andrews, Gloucester	64 (R)	May
271	Copenhagen Market..... M. A. Pacosa, Chicopee	66 (R)	April
411	Danish Ball Head..... Ross Bros. Co., Worcester	79 (R)	May
215	F. H. WOODRUFF & SONS, Milford, Conn. Golden Acre..... Waldron Hardware Co., Taunton	83 (R)	April
348	Danish Ball Head..... Pierson Hardware Co., Pittsfield	89	April
1032	S. D. WOODRUFF & SONS, Orange, Conn. Danish Ball Head..... W. E. Aubuchon Co. Inc., Fitchburg	90	May
<b>CARROT</b>			
229	G. O. ANDERSON & SONS, Arlington Chantenay..... (Wholesaler's germination test — 75%) G. Arthur Skelton, Bedford	73	May
314	JOSEPH BRECK & SONS, INC., Boston Danvers Half Long..... Whitcomb & Carter, Beverly	62 (R)	June
262	CLEBNIK BROS., Lynn Chantenay..... (Wholesaler's germination test — 75%) Winer Bros., Beverly	72	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer and Place Collected	% Germination Found	1936 Month of Test
CARROTS — Continued			
338	CROSSMAN SEED CO., East Rochester, N. Y. Improved Long Orange..... J. B. Sibley & Son, Ware	58 (R)	June
255	FERRY-MORSE SEED CO., Detroit, Mich. Danvers..... Charles J. Gray, Gloucester	62 (R)	May
274	Danvers..... Frank Howe's Co., Chicopee Falls	71 (R)	April
379	Danvers..... Sears, Roebuck Co., North Adams	77	May
2168	FRASER'S, Wellesley Chantenay..... (Wholesaler's germination test — 75%) Stone Hardware Co., Brockton	74	June
2171	Oxheart, or Guerande..... (Wholesaler's germination test — 80%) Stone Hardware Co., Brockton	63 (R)	June
316	FREDONIA SEED CO., Fredonia, N. Y. Oxheart..... Frank H. Whitaker, East Longmeadow	53 (R)	April
369	Danvers Half Long..... A. H. Phillips, Inc., Cummington	66 (R)	June
461	Danvers Half Long..... Allen Wheeler, West Brookfield	48 (R)	June
222	LAKE SHORE SEED CO., Dunkirk, N. Y. Chantenay..... Schofield Hardware Co., North Attleboro	48 (R)	May
452	Chantenay..... P. A. Richards, Spencer	34	May
590	Chantenay..... Petracca's Market, Walpole	69	June
691	Danvers Half Long..... C. L. Burch Co., Provincetown	52 (R)	June
1066	Danvers Half Long..... Sherman's Hardware & Furniture Co., Plymouth	44	June
1075	Danvers Half Long..... M. J. Quingley, Middleboro	39	June
1103	Danvers Half Long..... Italian Grocery, Monson	44	June
2042	Chantenay..... Trott's Variety Store, Amherst	41	May
2069	Chantenay..... Leona Trespacz, West Warren	45 (R)	May
2089	Danvers Half Long..... A. Plamondon, West Berlin	47	May
2112	Chantenay..... J. Ferrare, Worcester	46	May
2130	Chantenay..... Uxbridge Hardware Co., Uxbridge	40	June
2142	Danvers Half Long..... Tanguy's Market, Northbridge	29	June
2200	Chantenay..... Plymouth Rock Hardware Co., Plymouth	46	June
427	NORTHRUP, KING & CO., Minneapolis, Minn. Improved Danvers Half Long..... Davis Hardware Co., Gardner	59 (R)	May



## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>CARROTS — Concluded</b>			
431	Oxheart..... Union Hardware Co., Fitchburg	62 (R)	June
210	PAGE SEED CO., Greene, N. Y. Danvers Half Long..... (Wholesaler's germination test — 60%) Frank H. Whitaker, East Longmeadow	60	April
346	Chantenay..... (Wholesaler's germination test — 60%) J. F. Robinson & Co., Ware	60	June
2056	ROSS BROS. CO., Worcester Hutchinson..... D. M. Hanft, Rutland	62 (R)	June
186	RUANE'S Newton Oxheart, or Guerande..... (Wholesaler's germination test — 80%) Roslindale Hardware Co., Roslindale	64 (R)	May
350	F. H. WOODRUFF & SONS, Milford, Conn. Short Horn..... Pierson Hardware Co., Pittsfield	75 (R)	June
<b>CAULIFLOWER</b>			
248	BARTLETT & DOW, Lowell Early Snowball..... Bartlett & Dow, Lowell	90	May
598	THOMAS W. EMERSON CO., Boston Early Snowball..... A. J. Cataldo's Sons, Franklin	71 (R)	June
2062	BUDD D. HAWKINS, Reading, Vt. Early Snowball..... C. L. Bigelow, Rutland	76	May
<b>CELERY</b>			
2158	THOMAS W. EMERSON CO., Boston Boston Market..... Moore's Hardware Co., Brockton	77	June
2138	FERRY-MORSE SEED CO., Detroit, Mich. Golden Yellow Self Blanching..... Carter Bros., Uxbridge	66	June
276	JEROME B. RICE SEED CO., Cambridge, N. Y. Golden Self-Blanching..... The Wells Hardware Co., Holyoke	48 (R)	April
<b>SWEET CORN</b>			
21	THOMAS W. EMERSON CO., Boston Golden Bantam..... J. H. Ogden Hardware Co., New Bedford	93	April
414	Golden Surprise..... Sherer's, Worcester	90	June
2079	Golden Sunshine..... The Adams Hardware Co., Northboro	93	June
2128	Golden Bantam..... Uxbridge Hardware Co., Uxbridge	90	June
192	FERRY-MORSE SEED CO., Detroit, Mich. Golden Bantam..... Charles J. Gray, Gloucester	81	May
378	Golden Bantam..... Sears, Roebuck Co., North Adams	87	May
367	FREDONIA SEED CO., Fredonia, N. Y. Golden Bantam..... (Wholesaler's germination test — 95%) M. F. Packard, Worthington	83 (R)	April

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
SWEET CORN — Continued			
CHARLES C. HART SEED CO., Wethersfield, Conn.			
340	Golden Sunshine (Early)..... C. F. Paige & Co., Athol	82 (R)	May
357	Golden Giant..... Berkshire Hardware Co., Pittsfield	92	April
361	Black Mexican..... Carr Hardware Co., Pittsfield	85	May
433	Golden Sunshine..... Leominster Hardware Co., Leominster	89	May
LAKE SHORE SEED CO., Dunkirk, N. Y.			
2032	Country Gentleman..... Metro Bros., Southbridge	57	May
D. LANDRETH SEED CO., Bristol, Pa.			
424	Black Mexican..... Elwood Adams, Inc., Worcester	82	May
1010	Sugar Corn Charlevoix..... Elwood Adams, Inc., Worcester	87 (R)	May
OLDS & WHIPPLE, Hartford, Conn.			
29	Whipple's Yellow..... Franklin Hardware Co., North Attleboro	92	April
PAGE SEED CO., Greene, N. Y.			
41	Golden Sunshine..... F. H. Whitaker, East Longmeadow	78 (R)	August
301	Yellow Bantam..... The Ripley Store, Blandford	83 (R)	May
401	Bantam..... Gatzke Hardware Co., Webster	68 (R)	August
1036	Golden Bantam..... Quaboag Roofing & Hardware Co., West Brookfield	86	June
JEROME B. RICE SEED CO., Cambridge, N. Y.			
61	Bantam Evergreen..... The Wells Hardware Co., Holyoke	89	April
306	Bantam Evergreen..... S. Allen's Sons, Greenfield	79	April
380	Golden Bantam..... Burlingame & Darby's Co., North Adams	84	May
1043	Golden Bantam..... C. M. Rossier, Paxton	85	June
1070	Early Crosby..... George E. Doane, Middleboro	95	June
2099	Bantam Evergreen..... Hamilton Hardware Co., Clinton	82	May
F. H. WOODRUFF & SONS, Milford, Conn.			
24	Golden Giant..... Waldron Hardware Co., Taunton	95	April
201	Golden Bantam..... Frank, the Seed Main, Springfield	91	April
352	Spanish Gold..... Pierson Hardware Co., Pittsfield	93	April
1034	Golden Bantam..... Union Hardware Co., Fitchburg	91	May
S. D. WOODRUFF & SONS, Orange, Conn.			
59	Golden Bantam..... Prentiss Brooks Co., Holyoke	74 (R)	April
1026	Golden Bantam..... W. E. Aubuchon Co., Fitchburg	83 (R)	June

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>SWEET CORN—Concluded</b>			
2086	Top Cross Bantam..... Farm Service Stores, West Berlin	91	May
<b>CRESS</b>			
2160	THOMAS W. EMERSON CO., Boston Early Curled..... Moore's Hardware Co., Brockton	55 (R)	June
693	LAKE SHORE SEED CO., Dunkirk, N. Y. Curled, or Pepper Grass..... C. L. Burch, Provincetown	52	June
<b>CUCUMBER</b>			
247	BARTLETT & DOW, Lowell Improved Long Green..... Bartlett & Dow, Lowell	85	May
313	EASTERN STATES FARMERS' EXCHANGE, West Springfield Clark's Special..... (Wholesaler's soil test — 96%) Eastern States Farmers' Exchange, West Springfield	90 (R)	April
275	FERRY-MORSE SEED CO., Detroit, Mich. Boston Pickling..... Frank's Hardware Co., Chicopee Falls	83	April
376	Long Green..... Sears, Roebuck Co., North Adams	97	May
1092	Boston Pickling..... Freeman's Variety Store, South Duxbury	86	June
363	FREDONIA SEED CO., Fredonia, N. Y. Early White Spine..... M. F. Packard, Worthington	60 (R)	April
269	CHARLES C. HART SEED CO., Wethersfield, Conn. Early and Prolific..... (Wholesaler's germination test — 75+%) Field Hardware Co., Chicopee	77 (R)	May
2061	BUDD D. HAWKINS, Reading, Vt. Improved Long Green..... C. L. Bigelow, Rutland	87 (R)	June
245	LAKE SHORE SEED CO., Dunkirk, N. Y. Boston Pickling..... Roslindale Hardware Co., Roslindale	41	May
443	Peerless White Spine..... Leicester Paint & Hardware Co., Leicester	46	May
451	Boston Pickling..... P. A. Richards, Spencer	40	May
1076	Boston Pickling..... M. J. Quingley, Middleboro	28	June
1082	Peerless White Spine..... Begley Bros., Middleboro	50	June
1086	Peerless White Spine..... S. C. N. Packard & Co., Wareham	43	June
1097	Boston Pickling..... L. H. Thompson, Wales	37	June
1101	Peerless White Spine..... Italian Grocery, Monson	48	June
2012	Boston Pickling..... C. F. Pease, Warren	41	May
2043	Boston Pickling..... Trott's Variety Store, Amherst	40	May
2093	Boston Pickling..... A. Plamondon, West Berlin	47	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
CUCUMBER — Concluded			
2110	Boston Pickling..... Leo Genattacio, Worcester	41	May
2141	Improved Long Green..... Tanguy's Market, Northbridge	50	June
2173	Peerless White Spine..... Fred Zotos, Brockton	35	June
2179	Boston Pickling..... Berzin Bros., Bridgewater	27	June
2184	Peerless White Spine..... Florida Fruit Store, Bridgewater	43	June
2185	Boston Pickling..... Florida Fruit Store, Bridgewater	35	June
2201	Boston Pickling..... Plymouth Rock Hardware Co., Plymouth	89	June
2203	Boston Pickling..... Sherman's Hardware & Furniture Store, Plymouth	49	June
NORTHROP, KING & CO., Minneapolis, Minn.			
101	Improved Long Green..... R. F. Ford, Huntington	75 (R)	May
329	Improved White Spine Early Fortune..... W. E. Aubuchon Co., Inc., Orange	88	April
2156	Improved Long Green..... Pierce Hardware Co., Millbury	74 (R)	June
PAGE SEED CO., Greene, N. Y.			
344	Early Cluster Pickling..... (Wholesaler's germination test — 85%) J. F. Robinson & Co., Ware	76 (R)	May
2048	Early Cluster..... (Wholesaler's germination test — 85%) Gilbertville Public Market, Gilbertville	87	May
JEROME B. RICE SEED CO., Cambridge, N. Y.			
303	Long Green..... S. Allen's Sons, Greenfield	85 (R)	May
2038	Boston Pickling..... Charles O. Montiguy, Southbridge	76 (R)	June
ROSS BROS. CO., Worcester			
230	Early Russian..... G. Arthur Skelton, Bedford	89	May
409	Imperator..... Ross Bros. Co., Worcester	83	May
F. H. WOODRUFF & SONS, Milford, Conn.			
1024	Long Green..... Fitchburg Hardware Co., Fitchburg	95	July
ENDIVE			
THOMAS W. EMERSON CO., Boston			
595	Broadleaf..... A. J. Cataldo's Sons, Franklin	74	May
FERRY-MORSE SEED CO., Detroit, Mich.			
2054	Broad-leaved Batavian..... Nellie Griffin's Store, Rutland	74	May
2135	Large Green Curled..... Carter Bros., Uxbridge	61	June
LAKE SHORE SEED CO., Dunkirk, N. Y.			
1089	Green Curled..... S. C. M. Packard & Co., Wareham	45	June
2121	Green Curled..... Italian Colonial Market, Worcester	50	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
ENDIVE — Concluded			
2183	Green Curled..... Florida Fruit Store, Bridgewater	35	June
298	ROSS BROS. CO., Worcester Broad Leaved or Escarole..... Peebles Store, Blandford	77 (R)	May
KALE			
100	NORTHROP, KING & CO., Minneapolis, Minn. Dwarf Green Curled..... R. F. Ford, Huntington	76 (R)	April
KOHL RABI			
284	FERRY-MORSE SEED CO., Detroit, Mich. Kohl Rabi..... Carlisle Hardware Co., Springfield	83 (R)	April
LETTUCE			
228	G. O. ANDERSON & SONS, Arlington Black Seeded Simpson..... (Wholesaler's germination test — 90%) G. Arthur Skelton, Bedford	96	June
249	BARTLETT & DOW, Lowell May King..... Bartlett & Dow, Lowell	49 (R)	June
601	W. F. COBB CO., Franklin Hanson Improved 17505, 3561..... W. F. Cobb Co., Franklin	96	June
312	EASTERN STATES FARMERS' EXCHANGE, West Springfield Dark Green Cos..... (Wholesaler's germination test — 96%) Eastern States Farmers' Exchange, West Springfield	95	April
237	THOMAS W. EMERSON CO., Boston Early Curled..... C. B. Coburn Co., Lowell	74 (R)	June
260	Tennis Ball..... L. E. Smith Co., Gloucester	89	May
217	FERRY-MORSE SEED CO., Detroit, Mich. Prize Head..... J. H. Ogden Hardware Co., New Bedford	77 (R)	April
273	Iceberg Type..... Frank's Hardware Co., Chicopee Falls	76	April
418	Early Curled Simpson..... (Wholesaler's germination test — 90%) Waite Hardware Co., Worcester	86	April
1093	Early Curled Simpson..... Freeman's Variety Store, So. Duxbury	87	June
2162	FRASER'S, Wellesley Prizehead..... (Wholesaler's germination test — 95%) F. Walter Giles Co., Brockton	93	June
2101	HAMILTON HARDWARE CO., Clinton Tennis Ball..... Hamilton Hardware Co., Clinton	75	June
277	CHARLES C. HART SEED CO., Wethersfield, Conn. Simpson's Early Curled..... (Wholesaler's germination test — 80+%) Federal Supply Co., Northampton	84	April
2027	Prize Head..... (Wholesaler's germination test — 80%) George C. Winter Co., Southbridge	79	May
2034	Iceberg..... (Wholesaler's germination test — 85%) Waite Hardware Co., Southbridge	80	June

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
LETTUCE — Continued			
2050	Simpson's Early Curled (Wholesaler's germination test — 80 + %) Chagnon's Market, Gilbertville	77	June
2059	BUDD D. HAWKINS, Reading, Vt. Early Prize Head C. L. Bigelow, Rutland	85	June
2040	HYGRADE SEED CO., Tuckahoe, N. Y. Big Boston (Wholesaler's germination test — 90 %) Perron's Hardware Co., Southbridge	98	May
246	LAKE SHORE SEED CO., Dunkirk, N. Y. Big Boston — Boston Grande Roslindale Hardware Co., Roslindale	43	June
444	Lattuga Mista, Mixed Leicester Paint & Hardware Co., Leicester	9	June
454	Grand Rapids Nation Wide Store, East Brookfield	54	June
591	Big Boston Petracca's Market, Walpole	44	June
1064	Cos, or Celery Lettuce Sherman's Hardware & Furniture Co., Plymouth	6	June
1065	Hanson Sherman's Hardware & Furniture Co., Plymouth	30	June
1095	Early Prize Head L. H. Thompson, Wales	22	June
1098	Grand Rapids L. H. Thompson, Wales	48	June
1106	Big Boston The O'Brien Grocery, Monson	39	June
2010	Grand Rapids C. F. Pease, Warren	59	June
2025	Early Prize Head George C. Winter Co., Southbridge	28	May
2029	Green Ince Head Metro Bros., Southbridge	29	May
2031	Big Boston Metro Bros., Southbridge	84	May
2033	Hanson Metro Bros., Southbridge	38	May
2046	Grand Rapids Trott's Variety Store, Amherst	55	May
2065	Grand Rapids W. Gondek, Warren	55	May
2068	Grand Rapids Leona Trespacz, West Warren	73	May
2091	Hanson A. Palmondon, West Berlin	36	May
2120	Grand Rapids Italian Colonial Market, Worcester	17	June
2131	Early Prize Head Uxbridge Hardware Co., Uxbridge	15	June
2144	Cos, or Celery Lettuce Salad Romaine Tanguy's Market, Northbridge	12	June
2151	Early Prize Head Lebontes Market, Northbridge	19	June

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
LETTUCE — Concluded			
2175	Grand Rapids..... Fred Zotos, Brockton	49	June
2182	Early Curled Silesia..... Florida Fruit Store, Bridgewater	86	June
2192	Grand Rapids..... C. M. Burnham, Plymouth	92	June
LEONARD SEED CO., Chicago, Ill.			
265	May King..... A. E. Wordell, New Bedford	99	April
NORTHRUP, KING & CO., Minneapolis, Minn.			
328	Improved Hanson Head..... W. E. Aubuchon Co. Inc., Orange	82 (R)	April
426	N. Y. Special..... Davis Hardware Co., Gardner	84	April
432	Paris White Cos..... Union Hardware Co., Fitchburg	93	June
PAGE SEED CO., Greene, N. Y.			
345	Grand Rapids..... (Wholesaler's germination test — 85%) J. F. Robinson & Co., Ware	95	April
JEROME B. RICE SEED CO., Cambridge, N. Y.			
2019	Big Boston..... Fred Parker, Fiskdale	74 (R)	May
ROSS BROS. CO., Worcester			
371	Big Boston..... H. F. Packard, Cummington	90	April
2057	Black Seeded Tennis Ball..... D. M. Hanff, Rutland	67 (R)	June
2084	Simpson Early Curled..... Andrews & Fay, Berlin	92	June
S. D. WOODRUFF & SONS, Orange, Conn.			
439	Tennis Ball B. S..... Farm Service Stores, Leominster	97	June
MUSKMELON			
FRASER'S, Wellesley			
2163	Osage, or Millers Cream..... (Wholesaler's germination test — 85%) J. Walter Giles Co., Brockton	84	June
HAMILTON HARDWARE CO., Clinton			
2100	Montreal Nutmeg..... Hamilton Hardware Co., Clinton	2	May
ONION			
THOMAS W. EMERSON CO., Boston			
597	Red Wethersfield..... A. J. Cataldo's Sons, Franklin	50 (R)	May
2161	Southport White Globe..... Moore's Hardware Co., Brockton	71 (R)	July
CHARLES C. HART SEED CO., Wethersfield, Conn.			
279	Large Red Wethersfield..... (Wholesaler's germination test — 80+%) J. Russell Co., Holyoke	74	May
BUDD D. HAWKINS, Reading, Vt.			
280	Yellow Globe Danvers..... Mutual Plumbing & Heating Co., Amherst	39 (R)	May
LAKE SHORE SEED CO., Dunkirk, N. Y.			
446	Large Yellow Danvers..... Leicester Paint & Hardware Co., Leicester	26	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
ONION — Concluded			
617	Large Yellow Danvers..... Littleton Coal and Grain Co., Littleton	3	May
2075	Silver Skin..... Joseph Fortuna, West Warren	17	May
242	NORTHROP, KING & CO., Minneapolis, Minn. Yellow Globe Danvers..... Smith Hardware Co., Lowell	61 (R)	June
270	ROSS BROS. CO., Worcester Yellow Globe Danvers..... M. A. Pacosa, Chicopee	68 (R)	May
282	Yellow Globe Danvers..... Mutual Plumbing & Heating Co., Amherst	65 (R)	May
410	Yellow Globe Danvers..... Ross Bros., Co. Worcester	85 (R)	June
2036	JEROME B. RICE SEED CO., Cambridge, N. Y. Yellow Globe Danvers..... Waite Hardware Co., Southbridge	62 (R)	May
441	S. D. WOODRUFF & SONS, Orange, Conn. Yellow Globe..... Farm Service Stores, Leominster	70 (R)	June
1031	Yellow Globe Danvers..... W. E. Aubuchon Co. Inc., Fitchburg	82	May
PARSNIP			
232	G. O. ANDERSON & SONS, Arlington Improved Hollow Crown, or Guernsey..... (Wholesaler's germination test — 80%) G. Arthur Skelton, Bedford	77	May
224	JOSEPH BRECK & SONS, INC., Boston Savoy Smooth..... Whitcomb & Carter, Beverly	63	May
299	THOMAS W. EMERSON CO., Boston Improved Hollow Crown..... Peebles Store, Blandford	83	May
2159	Improved Hollow Crown..... Moore's Hardware Co., Brockton	90	June
364	FREDONIA SEED CO., Fredonia, N. Y. Hollow Crown..... M. F. Packard, Worthington	64	May
297	CHARLES C. HART SEED CO., Wethersfield, Conn. Hollow Crown..... (Wholesaler's germination test — 50+%) Peebles Store, Blandford	30 (R)	June
243	JEROME B. RICE SEED CO., Cambridge, N. Y. Hollow Crown..... Smith Hardware Co., Lowell	52 (R)	May
320	F. H. WOODRUFF & SONS, Milford, Conn. Hollow Crown..... F. I. Webster Co., Turners Falls	69	May
351	Hollow Crown..... Pierson Hardware Co., Pittsfield	71	May
442	S. D. WOODRUFF & SONS, Orange, Conn. Hollow Crown..... Farm Service Stores, Leominster	46 (R)	May
PARSLEY			
600	W. F. COBB CO., Franklin Champion Moss Curled, 3574 ASG..... W. F. Cobb Co., Franklin	84	June



## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
PARSLEY — Concluded			
419	FERRY-MORSE SEED CO., Detroit, Mich. Plain..... Waite Hardware Co., Worcester	66 (R)	June
2021	FREDONIA SEED CO., Fredonia, N. Y. Double Curled..... W. Gaulia, Fiskdale	67 (R)	June
2028	CHARLES C. HART SEED CO., Wethersfield, Conn. Hamburg..... (Wholesaler's germination test — 65+%) George C. Winter Co., Southbridge	62	May
2049	Moss Curled..... (Wholesaler's germination test — 70+%) Chagnon's Market, Gilbertville	63	May
457	LAKE SHORE SEED CO., Dunkirk, N. Y. Turnip-Rooted, or Hamburg..... Nation Wide Store, East Brookfield	6	May
1073	Turnip-Rooted, or Hamburg..... M. J. Quingley, Middleboro	4	June
1090	Double Curled..... S. C. M. Packard & Co., Wareham	18	June
2066	Turnip-Rooted, or Hamburg..... W. Gondek, Warren	7	May
2092	Double Curled..... A. Plamondon, West Berlin	17	May
2116	Turnip-Rooted or Hamburg..... J. Ferrare, Worcester	5	June
2124	Hamburg..... John Soloperto, Worcester	11	May
2186	Turnip-Rooted, or Hamburg..... Florida Fruit Store, Bridgewater	10	June
2194	Plain Semplce..... C. M. Burnham, Plymouth	19	June
PEAS			
189	BARTLETT & DOW CO., Lowell Telephone..... Bartlett & Dow Co., Lowell	78	May
42	JOSEPH BRECK & SONS, INC., Boston Sutton's Excelsior..... Whitcomb & Carter Co., Beverly	68 (R)	May
22	THOMAS W. EMERSON CO., Boston Telephone..... J. H. Ogden Hardware Co., New Bedford	87	April
27	Nott's Excelsior..... Taunton Hardware Co., Taunton	85	April
28	Laxtonia..... Franklin Hardware Co., North Attleboro	76 (R)	April
185	Sutton's Excelsior..... C. B. Coburn, Lowell	86	May
197	Laxton Progress..... Cobb, Bates & Yerxa, Taunton	93	April
327	Thomas Laxton..... Orange Hardware Co., Orange	90	April
413	Sutton's Excelsior..... Sherer's, Worcester	87	May
2078	Blue Bantam..... The Adams Hardware Co., Northboro	86	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety Dealer, and Place Collected	<sup>or</sup> Germination Found	1936 Month of Test
PEAS — Continued			
2096	Tall Telephone..... W. M. Lee, Clinton	92	May
2133	Sutton's Excelsior..... Uxbridge Hardware Co., Uxbridge	91	June
377	FERRY-MORSE SEED CO., Detroit, Mich. Premium Gem..... Sears, Roebuck Co., North Adams	77 (R)	May
365	FREDONIA SEED CO., Fredonia, N. Y. Telephone..... M. F. Packard, Worthington	88	April
18	CHARLES C. HART SEED CO., Wethersfield, Conn. Gradus..... Lepper Hardware Co., Attleboro	90	April
339	Sutton's Excelsior..... C. F. Paige & Co., Athol	93	May
397	Tall Telephone..... F. A. Frizzell, Hinsdale	78	May
435	Sutton's Excelsior..... Leominster Hardware Co., Leominster	77	May
1083	Laxton's Progress..... T. W. Pierce Hardware Co., Middleboro	92	July
1084	Dwarf Telephone..... T. W. Pierce Hardware Co., Middleboro	78	May
2007	LAKE SHORE SEED CO., Dunkirk, N. Y. American Wonder..... C. F. Pease, Warren	51	May
2073	Telephone..... Joseph Fortuna, West Warren	47	May
53	D. LANDRETH SEED CO., Bristol, Pa. Nott's Excelsior..... J. Russell & Co., Holyoke	94	April
425	Landreth's Extra Early..... Elwood Adams Inc., Worcester	82	May
35	LEONARD SEED CO., Chicago, Ill. Alaska..... Winer Bros., Beverly	95	May
205	Little Marvel..... A. E. Wordell, New Bedford	78 (R)	May
2153	NORTHROP, KING & CO., Minneapolis, Minn. Gradus..... Pierce Hardware Co., Millbury	90	June
300	PAGE SEED CO., Greene, N. Y. Little Marvel..... The Ripley Store, Blandford	90	April
389	American Wonder..... (Wholesaler's germination test — 90%) Ford & Parker, Dalton	76 (R)	August
399	Gradus..... Gatzke Hardware Co., Webster	72 (R)	May
191	JEROME B. RICE SEED CO., Cambridge, N. Y. Gradus, or Prosperity..... L. E. Andrews, Gloucester	76	May
302	Dwarf Early..... R. E. Faulkner, Palmer	90	May
318	Blue Bantam..... Clark Hardware Co., Greenfield	87	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>PEAS — Concluded</b>			
375	Gradus..... Payne-Cummings Co., North Adams	61 (R)	June
381	Sutton's..... Burlingame & Darby Co., North Adams	9	May
1069	Alaska..... George E. Doane, Middleboro	93	May
2098	Dwarf Telephone..... Hamilton Hardware Co., Clinton	73	May
2005	ROSS BROS. CO., Worcester Gradus..... A. E. Tucker, Warren	75	May
322	F. H. WOODRUFF & SONS, Milford, Conn. Dwarf Telephone..... F. I. Webster Co., Turners Falls	87	April
1035	Low Peas..... Union Hardware Co., Fitchburg	75	May
1041	Laxtonia..... Nellie Griffin's Store, Rutland	79	May
392	S. D. WOODRUFF & SONS, Orange, Conn. Champion of England..... C. F. Glennon, Dalton	90	May
1030	Gradus..... W. E. Aubuchon Co., Fitchburg	90	May
2085	Thomas Laxton..... Farm Service Stores, West Berlin	87	May
<b>PEPPER</b>			
2136	FERRY-MORSE SEED CO., Detroit, Mich. Pimiento..... Carter Bros., Uxbridge	77 (R)	July
450	LAKE SHORE SEED CO., Dunkirk, N. Y. Red Bell, or Bull Nose..... P. A. Richards, Spencer	45	May
593	Cayenne, or Long Red..... Petracca's Market, Walpole	18	June
2149	Red Bell, or Bull Nose..... Lebontes Market, Northbridge	15	June
<b>PUMPKIN</b>			
416	THOMAS W. EMERSON CO., Boston Sweet or Sugar..... Sherer's, Worcester	78 (R)	June
2137	FERRY-MORSE SEED CO., Detroit, Mich. Large Yellow..... Carter Bros., Uxbridge	90	June
2080	BUDD D. HAWKINS, Reading, Vt. New England Sugar, or Pie..... Northboro Hardware Co., Northboro	77 (R)	June
<b>RADISH</b>			
261	CLEBNIK BROS., Lynn Early Scarlet Turnip..... (Wholesaler's germination test — 90%) Winer Bros., Beverly	69 (R)	June
311	EASTERN STATES FARMERS' EXCHANGE, West Springfield Early Scarlet Globe..... (Wholesaler's germination test — 74%) Eastern States Farmers' Exchange, West Springfield	84	April

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>RADISH — Continued</b>			
256	FERRY-MORSE SEED CO., Detroit, Mich. Early Scarlet Charles J. Gray & Sons, Gloucester	85	June
421	Crimson Giant Turnip. Waite Hardware Co., Worcester	84	May
2139	Early Scarlet Globe Carter Bros., Uxbridge	85	June
2164	FRASER'S, Wellesley Early Scarlet Turnip, or Ravenillo (Wholesaler's germination test — 90%) J. Walter Giles Co., Brockton	70 (R)	June
2169	Long White Icicle (Wholesaler's germination test — 90%) Stone Hardware Co., Brockton	80 (R)	July
368	FREDONIA SEED CO., Fredonia, N. Y. Long White Icicle A. H. Phillips Inc., Cummington	92	May
436	CHARLES C. HART SEED CO., Wethersfield, Conn. Round Black Spanish (Wholesaler's germination test — 70+%) Leominster Hardware Co., Leominster	69 (R)	June
458	LAKE SHORE SEED CO., Dunkirk, N. Y. Round Black Spanish Winter Nation Wide Store, East Brookfield	42	May
592	Long White Icicle Petracca's Market, Walpole	41	May
1044	Round Black Spanish Winter Joseph Fortuna, West Warren	40	May
1053	French Breakfast John Soloperto, Worcester	44 (R)	June
1077	Early Red Turnip White Tipped M. J. Quingley, Middleboro	34 (R)	July
1079	Round Black Spanish Winter Begley Bros., Middleboro	33	June
1094	French Breakfast L. H. Thompson, Wales	37	June
1099	Early Red Turnip White Tipped Italian Grocery, Monson	21	June
1105	Early Red Turnip The O'Brien Grocery, Monson	28	June
2011	Early Red Turnip C. F. Pease, Warren	23	May
2016	French Breakfast Ledoux Market, Brimfield	25	May
2026	Long White Icicle George C. Winter Co., Southbridge	72	May
2030	French Breakfast Metro Bros., Southbridge	32	May
2044	Long White Icicle Trott's Variety Store, Amherst	46	May
2045	Early Red Turnip Trott's Variety Store, Amherst	24	May
2063	Early Red Turnip W. Gondek, Warren	25	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>RADISH — Concluded</b>			
2067	French Breakfast..... W. Gondek, Warren	66	May
2090	Long White Icicle..... A. Palmondon, West Berlin	46	May
2108	Round Black Spanish Winter..... Leo Genattacio, Worcester	88	May
2115	French Breakfast..... J. Ferrare, Worcester	37	May
2140	Early Red Turnip..... Tanguy's Market, Northbridge	42	June
2146	Early Red Turnip..... Labontes Market, Northbridge	28	June
2174	Early Red Turnip, White Tipped..... Fred Zotos, Brockton	30	June
2177	Early Red Turnip..... Berzin Bros., Bridgewater	49	June
2190	Round Black Spanish Winter..... John Canovaro Hardware Co., Kingston	46	June
2193	Round Black Spanish Winter..... C. M. Burnham, Plymouth	68	June
429	NORTHRUP, KING & CO., Minneapolis, Minn. Early Scarlet White Turnip..... Davis Hardware Co., Gardner	78 (R)	June
430	Long White Icicle..... Union Hardware Co., Fitchburg	86 (R)	June
2002	French Breakfast..... Allen Wheeler, West Brookfield	73 (R)	June
134	PAGE SEED CO., Greene, N. Y. Early Scarlet White Tip..... (Wholesaler's germination test — 85%) J. F. Robinson & Co., Ware	84	April
267	JEROME B. RICE SEED CO., Cambridge, N. Y. Long White Icicle..... Field Hardware Co., Chicopee	65 (R)	April
216	F. H. WOODRUFF & SONS, Milford, Conn. Scarlet Globe..... Waldron Hardware Co., Taunton	72 (R)	April
<b>RUTA BAGA</b>			
285	FERRY-MORSE SEED CO., Detroit, Mich. Ruta Baga*..... Carlisle Hardware Co., Springfield	80 (R)	April
<b>SALSIFY</b>			
286	FERRY-MORSE SEED CO., Detroit, Mich. Salsify, or Vegetable Oyster, Mammoth Sandwich Island..... Carlisle Hardware Co., Springfield	88	April
2165	FRASER'S, Wellesley Salsify or Vegetable Oyster..... (Wholesaler's germination test — 95%) J. Walter Giles Co., Brockton	89	June
332	JEROME B. RICE SEED CO., Cambridge, N. Y. Salsify, Mammoth Vegetable Oyster..... Kyles Variety Store, Huntington	65	April
<b>SPINACH</b>			
225	JOSEPH BRECK & SONS, INC., Boston Round Thick Leaf..... Whitecomb & Carter, Beverly	69 (R)	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
SPINACH — Concluded			
257	THOMAS W. EMERSON CO., Boston Round Thick Leaf..... L. E. Smith, Gloucester	63 (R)	July
2157	Round Thick Leaf..... Moore's Hardware Co., Brockton	55	June
420	FERRY-MORSE SEED CO., Detroit, Mich. Savoy-Leaved..... Waite Hardware Co., Worcester	82	May
2060	BUDD D. HAWKINS, Reading, Vt. American Savoy-Leaved..... C. L. Bigelow, Rutland	57	May
221	LAKE SHORE SEED CO., Dunkirk, N. Y. Round Leaf..... Schofield Hardware Co., North Attleboro	35	April
1081	Round Leaf..... Begley Bros., Middleboro	68	June
1087	Round Leaf..... S. C. M. Packard & Co., Wareham	34	June
2129	Round Leaf..... Uxbridge Hardware Co., Uxbridge	24	June
2148	Round Leaf..... Lebontes Market, Northbridge	22	June
2047	PAGE SEED CO., Greene, N. Y. Bloomsdale..... (Wholesaler's germination test — 70%) Gilbertville Public Market, Gilbertville	60 (R)	June
244	JEROME B. RICE SEED CO., Cambridge, N. Y. Victoria..... (Wholesaler's germination test — 96%) Smith Hardware Co., Lowell	79	May
2103	Bloomsdale Savoy Leaved..... Frank B. Kelton, Holden	54 (R)	May
202	F. H. WOODRUFF & SONS, Milford, Conn. Bloomsdale Savoy..... Frank, the Seed Man, Springfield	80	April
SQUASH			
226	JOSEPH BRECK & SONS, INC., Boston Warren..... Whitcomb & Carter, Beverly	92	June
594	THOMAS W. EMERSON CO., Boston Early Summer Crookneck..... A. J. Cataldo's Sons, Franklin	89	June
1039	Summer Crookneck..... George C. Winter Co., Southbridge	92	June
2018	FERRY-MORSE SEED CO., Detroit, Mich. Early White Bush Scallop..... Fred Parker, Fiskdale	87	June
2055	Hubbard..... Nellie Griffin's Store, Rutland	91	June
2105	Hubbard..... Holden Hardware Co., Holden	89	June
2022	FREDONIA SEED CO., Fredonia, N. Y. Hubbard..... W. Gaulin, Fiskdale	36 (R)	June
2001	NORTHROP, KING & CO., Minneapolis, Minn. Table Queen..... Allen Wheeler, West Brookfield	57 (R)	June

## 1935 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
SQUASH — Concluded			
304	JEROME B. RICE SEED CO., Cambridge, N. Y. Blue Hubbard..... S. Allen's Sons, Greenfield	90 (R)	May
460	Giant Early Summer Crookneck..... Harry R. Lamb, Brookfield	58 (R)	June
2053	Giant Early Summer Crookneck..... H. E. Bingham, Hardwick	52 (R)	July
2102	Giant Early Summer Crookneck..... Frank B. Kelton, Holden	55 (R)	June
233	ROSS BROS. CO., Worcester Giant Summer Straight Neck..... L. E. Andrews, Gloucester	86	June
370	Giant Summer Straightneck..... H. F. Packard, Cummington	82 (R)	July
2037	Early Summer Crookneck..... Charles O. Montiguy, Southbridge	93	June
2083	Green Hubbard..... Andrews & Fay, Berlin	80 (R)	July
212	F. H. WOODRUFF & SONS, Milford, Conn. Summer Straight Neck..... Frank, the Seed Man, Springfield	98	April
SWISS CHARD			
177	W. F. COBB & CO., Franklin Lucullus A 1191..... W. F. Cobb & Co., Franklin	83	June
102	FERRY-MORSE SEED CO., Detroit, Mich. Swiss Chard..... R. F. Ford, Huntington	91	April
2003	FREDONIA SEED CO., Fredonia, N. Y. Swiss Chard, or Sea Kale..... Allen Wheeler, West Brookfield	68 (R)	June
1054	LAKE SHORE SEED CO., Dunkirk, N. Y. Swiss Chard, or Sea Kale Beet..... John Soloperto, Worcester	78 (R)	June
1107	Swiss Chard, or Sea Kale Beet..... The O'Brien Grocery, Monson	71 (R)	June
2008	Swiss Chard, or Sea Kale Beet..... C. F. Pease, Warren	75 (R)	May
2015	Swiss Chard, or Sea Kale Beet..... Ledoux Market, Brimfield	76 (R)	May
2107	Swiss Chard, or Sea Kale Beet..... Leo Genattacio, Worcester	75	June
2187	Swiss Chard, or Sea Kale Beet..... John Canovaro Hardware Co., Kingston	63	June
2155	NORTHROP, KING & CO., Minneapolis, Minn. Swiss Chard, or Spinach Beet..... Pierce Hardware Co., Millbury	76 (R)	July
2081	ROSS BROS. CO., Worcester Swiss Chard..... Northboro Hardware Co., Northboro	64 (R)	May
2088	S. D. WOODRUFF & SONS, Orange, Conn. Lucullus..... Farm Service Stores, West Berlin	72 (R)	June
TOMATO			
599	W. F. COBB CO., Franklin Stone, 34115 ASG..... W. F. Cobb Co., Franklin	93	May

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
TOMATO — Continued			
308	EASTERN STATES FARMERS' EXCHANGE, West Springfield Prichard, Scarlet Topper, Medium Early..... (Wholesaler's germination test — 90%) Easterns State Farmers' Exchange, West Springfield	82	April
417	THOMAS W. EMERSON CO., Boston Marglobe..... Sherer's, Worcester	80	May
2104	FERRY-MORSE SEED CO., Detroit, Mich. Stone..... Holden Hardware Co., Holden	84	May
2035	CHARLES C. HART SEED CO., Wethersfield, Conn. Hart's Improved New Stone..... (Wholesaler's germination test — 76%) Waite Hardware Co., Southbridge	69 (R)	May
2041	HYGRADE SEED CO., Tuckahoe, N. Y. Improved Ponderosa..... (Wholesaler's germination test — 85%) Perron's Hardware Co., Southbridge	65	May
447	LAKE SHORE SEED CO., Dunkirk, N. Y. New Stone..... Leicester Paint & Hardware Co., Leicester	62	May
456	Acme..... Nation Wide Stores, East Brookfield	59	May
1074	Acme..... M. J. Quingley, Middleboro	52	May
1088	New Stone..... S. C. M. Packard & Co., Wareham	51	June
1096	New Stone..... L. H. Thompson, Wales	47	June
1100	Acme..... Italian Grocery, Monson	54	June
1104	New Stone..... The O'Brien Grocery, Monson	53	June
2074	Acme..... Joseph Fortuna, West Warren	55	May
2111	New Stone..... Leo Genattacio, Worcester	66	June
2118	Acme..... Italian Colonial Market, Worcester	52	May
2123	New Stone..... Italian Colonial Market, Worcester	62	May
2125	Acme..... John Soloperto, Worcester	57	May
2197	Acme..... Home Grocery, Plymouth	54	June
2199	Ponderosa..... Plymouth Rock Hardware Co., Plymouth	62	June
2202	Acme..... Plymouth Rock Hardware Co., Plymouth	56	June
252	JEROME B. RICE SEED CO., Cambridge, N. Y. Earliana..... L. E. Andrews, Gloucester	84	May
331	John Baer..... Kyles Variety Store, Huntington	85	May
349	Earliana..... Kyles Variety Store, Huntington	90	June



## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
<b>TOMATO — Concluded</b>			
355	Ponderosa..... Kyles Variety Store, Huntington	91	April
2052	Rice's John Baer..... H. E. Bingham, Hardwick	83	May
272	ROSS BROS. CO., Worcester Extra Early John Baer..... M. A. Pacosa, Chicopee	93	April
2058	Dwarf Champion..... D. M. Hanff, Rutland	83	May
<b>TURNIP</b>			
258	THOMAS W. EMERSON CO., Boston Purple Top Strap Leaf..... L. E. Smith, Gloucester	87	May
254	FERRY-MORSE SEED CO., Detroit, Mich. White Egg..... Charles J. Gray, Gloucester	77 (R)	May
2166	FRASER'S, Wellesley Purple Top White Globe..... (Wholesaler's germination test — 95%) J. Walter Giles Co., Brockton	98	June
281	BUDD D. HAWKINS, Reading, Vt. Sweet German..... Mutual Plumbing & Heating Co., Amherst	78 (R)	April
455	LAKE SHORE SEED CO., Dunkirk, N. Y. Early Purple Top Strap-leaved..... Nation Wide Store, East Brookfield	83 (R)	May
619	Early Purple Top..... Littleton Coal & Grain Co., Littleton	89	May
1078	Early Purple Top Strap-leaved..... Begley Bros., Middleboro	86	June
1108	Early Purple Top Strap-leaved..... The O'Brien Grocery, Monson	41	June
2009	Ruta Baga..... C. F. Pease, Warren	27	May
2017	Ruta Baga..... Ledoux Market, Brimfield	30	May
2023	Yellow Globe..... George C. Winter Co., Southbridge	38	May
2070	Ruta Baga..... Leona Trespacz, West Warren	33	May
2117	Ruta Baga..... J. Ferrare, Worcester	26	May
2119	Yellow Globe..... Italian Colonial Market, Worcester	26	May
2134	Early Purple Top Strap-leaved..... Uxbridge Hardware Co., Uxbridge	42	June
2172	Yellow Globe..... Fred Zotos, Brockton	30	June
2176	Early Purple Top Strap-leaved..... Fred Zotos, Brockton	42	June
2189	Yellow Globe..... John Canovaro Hardware Co., Kingston	37	June
2196	Ruta Baga..... Home Grocery, Plymouth	30	June

## 1936 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

## VEGETABLES — Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer, and Place Collected	% Germination Found	1936 Month of Test
TURNIP — Concluded			
283	ROSS BROS. CO., Worcester White Egg Mutual Plumbing & Heating Co., Amherst	90	April
187	RUANE'S, Newton Purple Top Strap-leaved (Wholesaler's germination test — 95%) Roslindale Hardware Co., Roslindale	96	May
440	S. D. WOODRUFF & SONS, Orange, Conn. Purple Top Farm Service Stores, Leominster	87	May

## Type and Variety Studies of Vegetables

Conducted in Conjunction with the Department of Vegetable Gardening  
Professor Grant B. Snyder

A large majority of home gardeners buy their vegetable seeds from the neighborhood store. The commercial grower may also buy from this source if he runs short or has forgotten to order a certain crop from his regular seedsman. These various stores and shops in the neighborhood community are, therefore, important sources of garden seeds.

Seeds, with most of these stores, are a side line. The person selling them has little or no knowledge of what is being sold other than the information printed on the packet and the price. The conditions under which the seed is stored and displayed are too frequently very poor, resulting in poor germination when planted in the garden. Most of the varieties sold are standard sorts. Newer improved varieties are generally not listed.

It has been found that in a fair percentage of cases, seed purchased from these sources has been variable in germination and in trueness to name. In order to definitely check the performance of packet and bulk seed sold by these merchants, the Department of Vegetable Gardening has cooperated with the Seed Laboratory in making germination tests and in checking the trueness to name of samples purchased on the open market by state inspectors.

Some 150 lots of seed were included in the field trials. These consist of beans, beets, carrots, lettuce, onions, parsnips, radishes, spinach, squash and turnips.

Field notes on germination indicated fairly good vitality of practically all lots.

The various lots were mostly within the type range for the variety specified on the seed package. One source, however, (Lake Shore Seed Company of Dunkirk, N. Y.) was very poor, for practically all lots included in the trials showing marked variation in type and maturity as well as disease susceptibility.

Results of the field trials are qualified as being "satisfactory" when true to the name of variety on the seed packet; "fair" when only a small percentage of variation from the type occurs, or when the type is poor for the name on the packet; and "poor" where a wide variation from the type of the variety given on the packet occurs, extreme variation of growth exists, or mosaic disease carried by the seed severely reduces yield or value of the crop.

Lot No.	Variety and Source	Trueness of Name	Remarks
BEANS			
20	THOMAS W. EMERSON CO., Boston Pencil Pod Black Wax J. H. Ogden Hardware Co., New Bedford	Satisfactory	
196	FERRY-MORSE SEED CO., Detroit, Mich. Kentucky Wonder Wax Cobb, Bates & Yerxa, Taunton	Satisfactory	
223	LAKE SHORE SEED CO., Dunkirk, N. Y. Golden Wax Schofield Hardware Co., North Attleboro	Fair	All plants had mosaic, 3% runners, 7% very late
602	Kentucky Wonder Vanderhoof Hardware Co., Concord	Fair	All plants had mosaic and rust
2072	Tennessee Green Pod Leona Trespacz, West Warren	Fair	All plants had mosaic
2106	Red Valentine Leo Genattacio, Worcester	Fair	All plants had severe mosaic, quality very poor
2114	Golden Wax J. Ferrare, Worcester	Fair	All plants had mosaic, 10% very late
2132	Black Wax Uxbridge Hardware Co., Uxbridge	Fair	All plants had mosaic
2143	Golden Wax Tanguy's Market, Northbridge	Fair	All plants had mosaic, 4% runners
2147	Red Valentine Labontes Market, Northbridge	Fair	All plants had mosaic, quality very poor
2178	Tennessee Green Pod Berzin Bros., Bridgewater	Poor	All plants had mosaic, 10% runner plants
2188	Black Wax John Canovaro Hardware Co., Kingston	Satisfactory	All plants had mosaic
2195	Golden Wax Home Grocery, Plymouth	Fair	All plants had mosaic
51	D. LANDRETH SEED CO., Bristol, Pa. Pencil Pod Black Wax J. Russell & Co., Holyoke	Satisfactory	
60	JEROME B. RICE SEED CO., Cambridge, N. Y. Round Pod Kidney Wax The Wells Hardware Co., Holyoke	Satisfactory	
203	F. H. WOODRUFF & SONS, Milford, Conn. Pencil Pod Black Wax Frank, the Seed Man, Springfield	Satisfactory	
BEETS			
219	JOSEPH BRECK & SONS, INC., Boston Detroit Dark Red Schofield Hardware Co., North Attleboro	Poor	12% off type, and of turnip shape
325	THOMAS W. EMERSON CO., Boston Early Blood Turnip Orange Hardware Co., Orange	Satisfactory	
268	CHARLES C. HART SEED CO., Wethersfield, Conn. Early Blood Turnip Field Hardware Co., Chicopee	Satisfactory	
362	Giant Long Red Mangel Carr Hardware Co., Pittsfield	Satisfactory	
453	LAKE SHORE SEED CO., Dunkirk, N. Y. Extra Early Egyptian Blood P. D. Richards, Spencer	Fair	4% off type — growth very poor
2014	Dewing's Improved Blood Red Ledoux Market, Brimfield	Fair	4% off type — growth poor
2024	Detroit Dark Red George C. Winter Co., Southbridge	Poor	16% off type, very variable
2109	Dewing's Improved Blood Red Leo Genattacio, Worcester	Poor	16% off type, growth very variable

Lot No.	Variety and Source	Trueness of Name	Remarks
<b>BEETS — Concluded</b>			
428	NORTHROP, KING & CO., Minneapolis, Minn. Extra Early Egyptian..... Davis Hardware Co., Gardner	Poor	32% roots distinctly off type in shape
400	PAGE SEED CO., Greene, N. Y. Early Blood Turnip..... Gatzke Hardware Co., Webster	Satisfactory	
253	JEROME B. RICE SEED CO., Cambridge, N. Y. Crosby's Egyptian..... L. E. Andrews Co., Gloucester	Satisfactory	
231	ROSS BROS. CO., Worcester Edmond's Blood Turnip..... G. Arthur Skelton, Bedford	Fair	8% off type, being quite flat
372	Crosby's Early Egyptian..... H. F. Packard, Cummington	Satisfactory	
263	F. H. WOODRUFF & SONS, Milford, Conn. Detroit Dark Red..... Waldron Hardware Co., Taunton	Satisfactory	
<b>CABBAGE</b>			
310	EASTERN STATES FARMERS' EXCHANGE, W. Springfield Golden Acre (Regular)..... Eastern States Farmers' Exchange, W. Springfield	Satisfactory	
2170	FRASER'S, Wellesley Early Wakefield..... Stone Hardware Co., Brockton	Fair	Heads very short, almost oval, very poor type
2051	FREDONIA SEED CO., Fredonia, N. Y. Danish Ballhead..... Chagnon's Market, Gilbertville	Satisfactory	
354	CHARLES C. HART SEED CO., Wethersfield, Conn. Copenhagen Market..... Berkshire Hardware Co., Pittsfield	Satisfactory	
17	Premium Late Flat Dutch..... Lepper Hardware Co., Attleboro	Poor	20% Danish Ballhead
437	Drumhead Savoy..... Leominster Hardware Co., Leominster	Satisfactory	
264	LEONARD SEED CO., Chicago, Ill. Copenhagen Market..... A. E. Wordell, New Bedford	Satisfactory	
218	PAGE SEED CO., Greene, N. Y. Danish Ballhead..... J. H. Ogden Hardware Co., New Bedford	Satisfactory	
271	ROSS BROS. CO., Worcester Copenhagen Market..... M. A. Pacosa, Chicopee	Satisfactory	
234	Danish Ballhead..... L. E. Andrews, Gloucester	Fair	Type very poor for variety named
411	Danish Ballhead..... Ross Bros. Co., Worcester	Poor	
215	F. H. WOODRUFF & SONS, Milford, Conn. Golden Acre..... Waldron Hardware Co., Taunton	Satisfactory	
348	Danish Ballhead..... Pierson Hardware Co., Pittsfield	Satisfactory	
1032	S. D. WOODRUFF & SONS, Orange, Conn. Danish Ballhead..... W. E. Aubuchon Co. Inc., Fitchburg	Satisfactory	
<b>CARROT</b>			
229	G. O. ANDERSON & SONS, Arlington Chantenay..... G. Arthur Skelton, Bedford	Satisfactory	
314	JOSEPH BRECK & SONS, INC., Boston Danvers Half Long..... Whitcomb & Carter, Beverly	Fair	Very variable and 18% produced no root

Lot No.	Variety and Source	Trueness of Name	Remarks
CARROTS — Concluded			
262	CLEBNIK BROS., Lynn Chantenay..... Winer Bros., Beverly	Satisfactory	
338	CROSSMAN SEED CO., East Rochester, N. Y. Improved Long Orange..... J. B. Sibley & Son, Ware	Poor	14% off type, 14% multiple roots
274	FERRY-MORSE SEED CO., Detroit, Mich. Danvers Half Long..... Frank Howe's Co., Chicopee Falls	Satisfactory	
379	Danvers Half Long..... Sears, Roebuck Co., North Adams	Satisfactory	Variable in maturity
222	LAKE SHORE SEED CO., Dunkirk, N. Y. Chantenay..... Schofield Hardware Co., North Attleboro	Satisfactory	
452	Chantenay..... P. A. Richards, Spencer	Satisfactory	
2089	Danvers Half Long..... A. Plamondon, West Berlin	Fair	12% off type, growth variable
2112	Chantenay..... J. Ferrare, Worcester	Satisfactory	
427	NORTHROP, KING & CO., Minneapolis, Minn. Improved Danvers Half Long..... Davis Hardware Co., Gardner	Satisfactory	
210	PAGE SEED CO., Greene, N. Y. Danvers Half Long..... Frank H. Whitaker, E. Longmeadow	Satisfactory	
346	Chantenay..... J. F. Robinson & Co., Ware	Fair	12% off type, 10% did not produce roots
2056	ROSS BROS. CO., Worcester Hutchinson..... D. M. Hanff, Rutland	Fair	10% off type, 14% multiple roots
186	RUANE'S, Newton Oxheart or Guerande..... Roslindale Hardware Co., Roslindale	Satisfactory	
LETTUCE			
249	BARTLETT & DOW, Lowell May King..... Bartlett & Dow, Lowell	Poor	50% mixture of Grand Rapids and Prize Head
312	EASTERN STATES FARMERS' EXCHANGE, West Springfield Dark Green Cos..... Eastern States Farmers' Exchange, West Springfield	Satisfactory	
260	THOMAS W. EMERSON CO., Boston Tennis Ball..... L. E. Smith Co., Gloucester	Satisfactory	
217	FERRY-MORSE SEED CO., Detroit, Mich. Prize Head..... J. H. Ogden Hardware Co., New Bedford	Satisfactory	
273	New York Special, Iceberg Type..... Frank's Hardware Co., Chicopee Falls	Satisfactory	
418	Simpson Early Curled..... Waite Hardware Co., Worcester	Satisfactory	
277	CHARLES C. HART SEED CO., Wethersfield, Conn. Simpson Early Curled..... Federal Supply Co., Northampton	Satisfactory	
2040	HYGRADE SEED CO., Tuckahoe, N. Y. Big Boston..... Perrons Hardware Co., Southbridge	Satisfactory	This was Green-leaved Boston
265	LEONARD SEED CO., Chicago, Ill. May King..... A. E. Wordell, New Bedford	Satisfactory	
328	NORTHROP, KING & CO., Minneapolis, Minn. Improved Hanson Head..... W. E. Aubuchon Co. Inc., Orange	Satisfactory	

Lot No.	Variety and Source	Trueness of Name	Remarks
<b>LETTUCE — Concluded</b>			
426	New York Special..... Davis Hardware Co., Gardner	Satisfactory	
345	PAGE SEED CO., Greene, N. Y. Grand Rapids..... J. F. Robinson & Co., Ware	Satisfactory	
371	ROSS BROS. CO., Worcester Big Boston..... H. F. Packard, Cummington	Satisfactory	This was Green-leaved Boston
439	S. D. WOODRUFF & SONS, Orange, Conn. Tennis Ball..... Farm Service Stores, Leominster	Satisfactory	
<b>ONION</b>			
2161	THOMAS W. EMERSON CO., Boston Southport White Globe..... Moore's Hardware Co., Brockton	Satisfactory	3 bulbs of Red Wethersfield found
279	CHARLES C. HART SEED CO., Wethersfield, Conn. Large Red Wethersfield..... J. Russell Co., Holyoke	Satisfactory	
280	BUDD D. HAWKINS, Reading, Vt. Yellow Globe Danvers..... Mutual Plumbing & Heating Co., Amherst	Satisfactory	
446	LAKE SHORE SEED CO., Dunkirk, N. Y. Large Yellow Danvers..... Leicester Paint & Hardware Co., Leicester	Poor	Very badly mixed with white and brown bulbs
2075	Silver Skin..... Joseph Fortuna, West Warren	Satisfactory	
242	NORTHRUP, KING & CO., Minneapolis, Minn. Yellow Globe Danvers..... Smith Hardware Co., Lowell	Satisfactory	
2036	JEROME B. RICE SEED CO., Cambridge, N. Y. Yellow Globe Danvers..... Waite Hardware Co., Southbridge	Satisfactory	
270	ROSS BROS. CO., Worcester Yellow Globe Danvers..... M. A. Pacosa, Chicopee	Satisfactory	
441	S. D. WOODRUFF & SONS, Orange, Conn. Yellow Globe..... Farm Service Stores, Leominster	Satisfactory	
1031	Yellow Globe Danvers..... W. E. Aubuchon Co. Inc., Fitchburg	Satisfactory	
<b>PARSNIPS</b>			
232	G. O. ANDERSON & SONS, Arlington Improved Hollow Crown..... G. Arthur Skelton, Bedford	Satisfactory	
224	JOSEPH BRECK & SONS INC., Boston Savoy Smooth..... Whitcomb & Carter, Beverly	Satisfactory	
299	THOMAS W. EMERSON CO., Boston Improved Hollow Crown..... Peebles Store, Blandford	Satisfactory	
2159	Improved Hollow Crown..... Moore's Hardware Co., Brockton	Satisfactory	
364	FREDONIA SEED CO., Fredonia, N. Y. Hollow Crown..... M. F. Packard, Worthington	Satisfactory	
297	CHARLES C. HART SEED CO., Wethersfield, Conn. Hollow Crown..... Peebles Store, Blandford	Satisfactory	
243	JEROME B. RICE SEED CO., Cambridge, N. Y. Hollow Crown..... Smith Hardware Co., Lowell	Satisfactory	
320	F. H. WOODRUFF & SONS, Milford, Conn. Hollow Crown..... F. I. Webster Co., Turners Falls	Satisfactory	

Lot No.	Variety and Source	Trueness of Name	Remarks
PARSNIPS — Concluded			
351	Hollow Crown..... Pierson Hardware Co., Pittsfield	Satisfactory	
442	S. D. WOODRUFF & SONS, Orange, Conn. Hollow Crown..... Farm Service Stores, Leominster	Satisfactory	
RADISH			
261	CLEBNIK BROS., Lynn Early Scarlet Turnip..... Winer Bros., Beverly	Satisfactory	
311	EASTERN STATES FARMERS' EXCHANGE, W. Springfield Early Scarlet Globe..... Eastern States Farmers' Exchange, W. Springfield	Satisfactory	
256	FERRY-MORSE SEED CO., Detroit, Mich. Early Scarlet..... Charles J. Gray & Sons, Gloucester	Satisfactory	
421	Crimson Giant Turnip..... Waite Hardware Co., Worcester	Satisfactory	
368	FREDONIA SEED CO., Fredonia, N. Y. Long White Icicle..... A. H. Phillips Inc., Cummington	Satisfactory	
436	CHARLES C. HART SEED CO., Wethersfield, Conn. Round Black Spanish..... Leominster Hardware Co., Leominster	Satisfactory	
1044	LAKE SHORE SEED CO., Dunkirk, N. Y. Round Black Spanish Winter..... Joseph Fortuna, West Warren	Fair	11% Long Black Spanish
2030	French Breakfast..... Metro Bros., Southbridge	Fair	Very variable in shape and color
429	NORTHROP, KING & CO., Minneapolis, Minn. Early Scarlet White Turnip..... Davis Hardware Co., Gardner	Satisfactory	
134	PAGE SEED CO., Greene, N. Y. Early Scarlet White Tip..... J. F. Robinson & Co., Ware	Satisfactory	
267	JEROME B. RICE SEED CO., Cambridge, N. Y. Long White Icicle..... Field Hardware Co., Chicopee	Satisfactory	
216	F. H. WOODRUFF & SONS, Milford, Conn. Scarlet Globe..... Waldron Hardware Co., Taunton	Satisfactory	
SPINACII			
225	JOSEPH BRECK & SONS, Boston Round Thick Leaf..... Whitcomb & Carter, Beverly	Satisfactory	
257	THOMAS W. EMERSON CO., Boston Round Thick Leaf..... L. E. Smith, Gloucester	Satisfactory	
2157	Round Thick Leaf..... Moore's Hardware Co., Brockton	Satisfactory	
420	FERRY-MORSE SEED CO., Detroit, Mich. Savoy-Leaved..... Waite Hardware Co., Worcester	Satisfactory	Bloomsdale Savoy
2060	BUDD D. HAWKINS, Reading, Vt. American Savoy leaved..... C. L. Bigelow, Rutland	Satisfactory	Bloomsdale Savoy
221	LAKE SHORE SEED CO., Dunkirk, N. Y. Round Leaf..... Schofield Hardware Co., North Attleboro	Satisfactory	
2129	Round Leaf..... Uxbridge Hardware Co., Uxbridge	Satisfactory	
2047	PAGE SEED CO., Greene, N. Y. Bloomsdale..... Gilbertville Public Market, Gilbertville	Satisfactory	Bloomsdale Savoy



Lot No.	Variety and Source	Trueness of Name	Remarks
<b>SPINACH — Concluded</b>			
JEROME B. RICE SEED CO., Cambridge, N. Y.			
244	Victoria..... Smith Hardware Co., Lowell	Satisfactory	
2103	Bloomsdale Savoy Leaved..... Frank B. Kelton, Holden	Satisfactory	
F. H. WOODRUFF & SONS, Milford, Conn.			
202	Bloomsdale Savoy Leaved..... Frank, the Seed Man, Springfield	Satisfactory	
<b>SQUASH</b>			
JOSEPH BRECK & SONS, Boston			
226	Warren..... Whitcomb & Carter, Beverly	Satisfactory	
FERRY-MORSE SEED CO., Detroit, Mich.			
2018	Early White Bush Scallop..... Fred Parker, Fiskdale	Satisfactory	
NORTHRUP, KING & CO., Minneapolis, Minn.			
2001	Table Queen..... Allen Wheeler, West Brookfield	Satisfactory	
JEROME B. RICE SEED CO., Cambridge, N. Y.			
2102	Giant Early Summer Crookneck..... Frank B. Kelton, Holden	Satisfactory	
ROSS BROS. CO., Worcester			
370	Giant Summer Straightneck..... H. F. Packard, Cummington	Satisfactory	
2037	Early Summer Crookneck..... Charles O. Montiguy, Southbridge	Satisfactory	
F. H. WOODRUFF & SONS, Milford, Conn.			
212	Summer Straightneck..... Frank, the Seed Man, Springfield	Satisfactory	
<b>TURNIP</b>			
THOMAS W. EMERSON CO., Boston			
258	Purple Top Strap Leaf..... L. E. Smith, Gloucester	Satisfactory	
FERRY-MORSE SEED CO., Detroit, Mich.			
254	White Egg..... Charles J. Gray, Gloucester	Satisfactory	
FRASER'S, Wellesley			
2166	Purple Top White Globe..... J. Walter Giles Co., Brockton	Satisfactory	
BUDD D. HAWKINS, Reading, Vt.			
281	Sweet German..... Mutual Plumbing & Heating Co., Amherst	Satisfactory	
LAKE SHORE SEED CO., Dunkirk, N. Y.			
2017	Ruta Baga..... Ledoux Market, Brimfield	Poor	35% Ruta Baga, 29% P. L. Milan, 30% White Egg, 6% others
2119	Yellow Globe..... Italian Colonial Market, Worcester	Satisfactory	
2134	Early Purple Top Strap Leaved..... Uxbridge Hardware Co., Uxbridge	Fair	Very variable in shape and maturity
2172	Yellow Globe..... Fred Zotos, Brockton	Satisfactory	
2176	Early Purple Top Strap Leaved..... Fred Zotos, Brockton	Fair	Very variable in shape and maturity
ROSS BROS. CO., Worcester			
283	White Egg..... Mutual Plumbing & Heating Co., Amherst	Satisfactory	
RUANE'S, Newton			
187	Purple Top Strap Leaved..... Roslindale Hardware Co., Roslindale	Satisfactory	
F. H. WOODRUFF & SONS, Milford, Conn.			
440	Purple Top..... Farm Service Stores, Leominster	Satisfactory	

## Quality of Onion Seed Produced in the Connecticut Valley, Season of 1935

From time to time, small amounts of onion seed have been grown by onion farmers in the Connecticut Valley. In general, however, the amounts produced have been less than a hundred pounds per grower and for personal use rather than for a market commodity.

High price for seed grown in 1934 to be planted in 1935 led farmers to produce more home-grown seed in 1935 than heretofore.

Locally-produced onion seed, tested at the Massachusetts Experiment Station Laboratory for germination, has never been of better than average quality, with much of it so low in viability as to be of questionable value. Such information as could be secured from the farmers who send in locally-produced onion seed, led to the inference that low viability is often due to incorrect methods of harvesting, drying, and cleaning the seed.

The common method of cleaning seed on the farm is to thresh by beating quantities of the seed capsules, contained in three-quarter-filled grain bags. Coarse stems and fragments of the fruit are then removed by screens, and the finer impurities and light seed separated by winnowing. The seed with the remaining impurities is then plunged into tubs containing water, stirred to remove air and, when the heavy seed have settled to the bottom, the lighter seed and floating impurities are skimmed off or removed by decanting. The remaining pure seed is then dried by various means before storing or planting. In general, this method is similar to that employed by the commercial grower, except that in onion-seed producing areas the climate favors thorough drying of the seed spread out, after floating, on canvas exposed to the air and sunshine.

The ten lots of seed received were threshed by rubbing between two sheets of corrugated rubber matting. The threshed material was then screened to remove dust and finer particles of plant substance, and the remainder cleaned in a Eureka Sample Testing Separator. This machine is a combination of screens and air blast, removing unthreshed seed and delivering a heavy grade of cleaned seed, which is here designated No. 1, as well as a lighter grade containing some of the heavier impurities. This lighter grade was again run through the machine submitting it to a heavier air blast than No. 1. This resulted in Grades No. 2 and No. 3. Usually the No. 3 grade contained impurities which could be removed by again running through the machine with a still heavier air blast. In a few instances, it was possible to break the seed down into 1, 2 and 3 grades or more, by this process. In several instances, only a grade No. 2 or 3 remained as pure cleaned seed — although in one instance five grades were procured. In several instances, the last grade separated contained impurities which could only be removed by floating the product in buckets of water. In these instances, the light seed and debris were thus removed and the remaining portion dried for several hours in screened-bottom metal trays over steam radiators. Samples of seed from each of the various grades derived from each lot of seed, according to this method of separation, were submitted to a laboratory test for viability.

Since our various grades of seed are really determined on the basis of weight, Grade 1 is made up of the heaviest seed in the sample, and progressively each succeeding grade is made up of lighter seed. It is interesting to note that in most instances, the heavier seed in any particular lot show the highest viability and the lowest grade oftentimes a viability so low as to throw considerable doubt upon the practicability of using this grade in production. As cleaned

by the farmer by his home methods of plunging the entire lot of seed into water and skimming off the floating seed and debris, the resulting product would naturally contain many seed of low or no viability. This would reduce the average of any lot, depending upon the proportions of lower grade seed contained, to a viability which might be only average and oftentimes below a test which is considered desirable for the lot of seed as a whole.

A much larger local production of onion seed during the summer of 1936 in the Connecticut Valley will give us an opportunity to test and clean a greater volume of onion seed during the winter of 1937. During this time it is hoped to continue this experiment on a much larger scale. There is evidence, based on the cleaning and tests of 1936, that with proper cultural and cleaning methods a very good quality of onion seed can be obtained under local conditions, assuming that proper culture and harvesting have also been employed.

The following table shows the weight of uncleaned seed for each of the ten lots, the total weight of the cleaned seed, and the weight and viability of each grade secured by repeated machine separations.

Lot No.	Weight of Seed		Grade No. 1		Grade No. 2		Grade No. 3		Grade No. 4	
	Before Cleaning Lb.	Clean Seed Lb.	Weight Lb.	Germination Percent	Weight Lb.	Germination Percent	Weight Lb.	Germination Percent	Weight Lb.	Germination Percent
*1	43.9	21.8	3.6	89	7.8	86	2.2	85	2.6	73
2	40.1	19.1	7.2	83	6.1	83	4.0	83	1.8	56
3	18.1	7.2	5.9	78	1.3	68				
4	6.6	4.0	1.6	82	.8	80	.7	65	.9	44
5	15.5	7.2	3.0	84	3.2	82	1.0	54		
6	14.0	4.7	3.0	81	.9	77	.8	55		
7	7.6	5.2	1.5	70	1.9	67	1.4	60	.4	43
8	59.2	14.3	3.0	78	4.3	78	3.7	68	3.3	30
9	3.3	2.5	.8	35	.9	33	.6	33	.2	18
10	28.2	10.5	1.1	81	2.3	75	3.6	67	3.5	30

\*This lot contained also 2.6 pounds of Grade No. 5, which gave a germination test of 59 percent.

### Studies of Flower Seeds

Conducted by the Seed Laboratory in Cooperation with the Department of Floriculture  
Olive M. Hoefle and Professor Clark L. Thayer

At present many home flower growers purchase their flower seeds from local stores of various kinds. The Seed Laboratory and the Department of Floriculture have cooperated this past summer in an effort to determine the quality of seed sold by such dealers. The seeds were collected on the open market by State Seed Inspectors, weighed and analyzed for purity in the laboratory, and tested for germination and trueness-to-type under field conditions. Seeds of 104 lots (7 bulk and 97 packets) were gathered, comprising a goodly number of the common flowers grown in small home gardens. Thirteen different seed firms or wholesalers were represented and thirty-eight different kinds of flower seeds, as follows:

Acroclinium.....	1	Larkspur.....	2
Ageratum.....	3	Lobelia.....	2
Alyssum.....	2	Lupines.....	2
China Asters.....	2	Marigolds.....	11
Bachelor's Buttons.....	8	Morning Glories.....	5
Brachycome.....	1	Nasturtiums.....	3
Calendula.....	7	Pansies.....	1
Candytuft.....	6	Petunia.....	4
Carnations and Pinks.....	3	Poppies.....	3
Cockscomb.....	2	Portulaca.....	2
Coreopsis.....	2	Salvia.....	1
Cosmos.....	2	Scabiosa.....	1
Didiscus.....	1	Snapdragon.....	2
Dimorphotheca.....	1	Sunflowers.....	1
Eschscholtzia.....	1	Sweet Peas.....	3
Forget-me-nots.....	2	Sweet Sultan.....	1
Four o'clocks.....	1	Verbena.....	2
Kochia.....	1	Zinnias.....	12
Total.....		104	

Most of the packets bore the common name of the flower, while a very few seedsmen added both the scientific and common names. Some listed the color, while others gave no indication as to what color might be expected, although several were marked "mixed." It was noted that the better wholesalers gave much of the desired information, stating the price as well as the approximate germination, the scientific and common names, and some description of the plant.

The entire contents of each packet, or in the case of bulk lots the entire sample drawn, were weighed and analyzed for purity. Wherever possible, the Weed Seeds and Other Crop Seeds were identified and recorded. (See Table 1.)

The amount of seed found in any one packet or lot varied from less than one gram (.3 gr.) to 48.0 grams. The price varied from five cents a packet to as high as twenty-five cents. There appeared to be little relation between the price and the quantity of seed. With Marigold (Guinea Gold) for instance, the quantity varied from .3 to 3.4 grams and the price ranged from ten to twenty-five cents. One wholesaler offered .3 gram, while another offered .8 gram of the same variety, both for ten cents a packet.

### Mechanical Purity

In an effort to obtain definite information as to the extent to which flower seeds, particularly those sold in sealed paper packets, carried impurities, a careful examination was made of each lot. Purity results will be found in Table 2.

Of the 104 lots of flower seeds, three or 2.88% were free of any impurities whatever. To state it in another way: 101 lots, or 97.12%, contained impurities in the form of Weed Seeds, Other Crop Seeds, seeds of plants other than the one in question, or Inert Materials consisting of fine chaff, dust, stems, floral parts, grit, or pieces of earth.

The purity percentage was found to vary from 81.70 in the case of Ageratum to 100.00 in the case of some of the Morning Glories and Sweet Peas.

### Weed Seeds

Weed seeds were found in 46 of the lots, or 44.23%. One packet of Bachelor Buttons contained .97% Weed Seeds, while a packet of Verbena contained .8%. A packet of Ageratum contained a total of 38 weeds (.60% by weight), representing 9 different genera, including 17 individual seeds of Crab Grass, which is classed as a noxious weed in many states. These, however, were the extreme cases, as some were found to be entirely free of weed seeds.

### Inert Matter

Of the 104 lots, a total of 99, or 95.19%, contained Inert Matter of one kind or another. Ageratum carried the highest percentage, probably due to the fact that the impurities were of the same general size and weight as the seed itself. One packet contained 17.42% of such materials. The presence or absence of impurities may be due in some cases to the ease with which the seeds can be cleaned. Thus Ageratum might be expected to contain a high percentage of Inert, since much of the Inert Material is of the same shape and weight as the seed itself.

### Other Crop Seed

Many of the packets contained seeds of flowers other than the kind under consideration, as well as seeds of field crops. Thirty-nine, or 37.50%, contained seeds of other crop plants. One packet of Ageratum ranked high in Other Crop Seed content with 2.74%. A packet of Kochia contained 28 crop seeds, representing 7 genera; a packet of Marigold contained 11 crop seeds, representing 10 genera; while another lot of Ageratum was found to have seeds of 11 different genera, with a total of 24 seeds.

The Weed Seeds and Other Crop Seeds found in the various packets may be accounted for in several different ways. Since some of the "extra" seeds were kinds that are not generally found growing with flower seeds in the fields, it appears either that they were placed there intentionally or that they entered through the repacketing process or through careless harvesting and handling methods. This may also be true of the Inert Matter found.

### Germination

No germination tests were made in the laboratory on any of the lots collected, since many of the packets contained too small a quantity of seed for both field and laboratory tests. After the purity tests were completed, the samples were turned over to Professor Clark L. Thayer of the Department of Floriculture, who conducted tests in the field to determine the actual quality and to check the trueness-to-name.

### Field Tests

The field tests show that in the majority of samples germination was satisfactory. However, in seven cases the seed failed to germinate and in a few cases germination was extremely poor. Due to the late date of planting, certain seeds, such as sweet peas, did not give good results.

As far as possible trueness-to-type or variety was determined, but since many lots were described as mixtures or did not carry varietal names, a wide range in color and form was permissible.

It will be noted that comparatively few of the novelties and named varieties

of recent introduction were included in the trials.

When the number of seeds permitted, rows thirty linear feet long were sown. Germination was rated as "good" if the seeds germinated in approximately two-thirds of the row; "fair", between one-third and two-thirds; and "poor" for one-third or less. Performance was designated as "satisfactory" if the varieties were true-to-name, producing only a low percentage of plants which were not true-to-form or color (one-third or less); "fair", between one-third and two-thirds not true, and "unsatisfactory", if less than one-third was true to name.





Crab grass ( <i>Digitaria sanguinalis</i> ).....	17	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-
Curled dock ( <i>Rumex crispus</i> ).....	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Delphinium sp.....	-	-	-	-	-	1	-	-	-	-	1	-	-	1	-	2	-
<i>Dianthus</i> sp.....	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
<i>Euphorbia</i> sp.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field speedwell ( <i>Veronica agrestis</i> ).....	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fire weed ( <i>Erechtites hieracifolia</i> ).....	1	6	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Forget-me-not ( <i>Myosotis</i> sp.).....	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Fremont's goosefoot ( <i>Chenopodium Fremontii</i> ).....	-	-	-	-	-	1	-	2	-	-	1	-	-	-	-	-	-
<i>Gramineae</i> sp.....	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Green foxtail ( <i>Setaria viridis</i> ).....	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
Johnson grass ( <i>Sorghum halapense</i> ).....	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Knotweed ( <i>Polygonum aviculare</i> ).....	-	13	-	-	-	1	-	2	-	-	-	-	-	-	-	1	1
<i>Kochia</i> sp.....	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
<i>Labiatae</i> sp.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lamb's quarters ( <i>Chenopodium album</i> ).....	-	-	-	-	-	-	3	2	-	-	1	-	-	1	-	2	-
Larkspur ( <i>Delphinium consolida</i> ).....	-	-	-	-	-	1	-	-	-	-	-	4	-	1	-	-	-
Lesser starwort ( <i>Aislne graminea</i> ).....	8	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-
Lettuce ( <i>Lactuca sativa</i> ).....	-	-	-	-	-	-	-	1	-	-	1	-	9	-	-	-	-
<i>Lobelia</i> sp.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mallow ( <i>Malva rotundifolia</i> ).....	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
<i>Malva</i> sp.....	-	-	3	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Marigold ( <i>Tagetes</i> sp.).....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Mignonette ( <i>Rosada odorata</i> ).....	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nettleleaf goosefoot ( <i>Chenopodium murale</i> ).....	-	2	2	-	1	1	-	2	-	-	-	-	-	4	-	-	1
Pansy ( <i>Viola</i> spp.).....	-	1	-	-	-	-	-	2	1	1	-	1	-	-	-	2	-
<i>Papaver</i> spp.....	1	-	-	-	-	-	3	-	1	-	7	3	-	3	-	-	-
Peppergrass ( <i>Lepidium virginicum</i> ).....	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Petunia ( <i>Petunia hybrida</i> ).....	8	-	-	-	-	1	-	2	-	-	1	2	-	1	2	-	1
Pigweed, rough ( <i>Amaranthus retroflexus</i> ).....	-	2	-	-	-	1	1	-	-	-	-	-	-	-	2	-	-
Pimpernel ( <i>Anagallis arvensis</i> ).....	3	2	-	-	-	1	1	-	-	-	-	-	-	-	-	1	7
Plantain, common ( <i>Plantago major</i> ).....	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poppy, Cal. ( <i>Eschscholzia californica</i> ).....	11	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	1
<i>Portulaca</i> spp.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Redtop ( <i>Agrostis alba</i> ).....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rye grass ( <i>Lolium</i> spp.).....	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Salvia</i> sp.....	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-
<i>Serophulariaceae</i> sp.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shepherd's purse ( <i>Capsella Bursa-pastoris</i> ).....	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-
Small-seeded false flax ( <i>Camelina microcarpa</i> ).....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





TABLE 2. FLOWER SEED INSPECTION

Lab. No.	Variety and Source	Purity Tests*				Tests of Performance**	
		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi-nation	Performance Remarks
ACROCLINIUM							
680	ROSS BROS. CO., Worcester Everlasting, Choice Mixed H. T. Crocker, Brewster	95.32	—	4.68	—	Fair	Satisfactory
622	CHARLES C. HART SEED CO., Wethersfield, Conn. Blue Perfection Montgomery Hardware Co., Ayer	81.70	.60	17.42	.28	Good	Satisfactory Only slight variations in color
AGERATUM							
659	MANDEVILLE & KING CO., Rochester, N. Y. Blue Floss Flower Needham Hardware Co., Needham	87.27	.07	12.53	.13	Good	Satisfactory Only slight variations in color
681	Blue Floss Flower J. D. Hilliard, Provincetown	86.24	.53	12.56	.67	Good	Satisfactory Only slight variations in color
ALYSSUM							
631	FERRY-MORSE SEED CO., Detroit, Mich. Sweet (Alyssum maritimum) C. Skelton Hardware Co., Newtonville	98.58	.48	.89	.05	Good	Satisfactory 10 % Dwarf
679	ROSS BROS. CO., Worcester Sweet (Alyssum maritimum) H. T. Crocker, Brewster	99.56	.19	.25	—	Good	Satisfactory Uniform
ASTER							
623	FERRY-MORSE SEED CO., Detroit, Mich. Giant Crego Purple Wilt Resistant C. Skelton Hardware Co., Newton Center	97.77	.23	2.00	—	Good	Satisfactory
666	VAUGHAN, Chicago, Ill. Heart of France H. V. Lawrence, Falmouth	99.88	—	.12	—	Poor	

\*Purity tests were made in the Seed Laboratory by Olive M. Hoefle.

\*\*Tests of Performance were made in the field by Professor Clark L. Thayer of the Floriculture Department.



## CALENDULA

239	THOMAS W. EMERSON CO., Boston Orange Shaggy..... C. B. Coburn, Lowell	98.79	—	1.21	—	Good	Satisfactory	Little variation in color
596	Orange King..... A. J. Cataldo's Sons, Franklin	97.58	—	2.42	—	Good	Satisfactory	Low percentage of single forms
630	FERRY-MORSE SEED CO., Detroit, Mich. Gold..... C. Skelton Hardware Co., Newtonville	97.92	—	2.08	—	Fair	Satisfactory	
588	CHARLES C. HART SEED CO., Wethersfield, Conn. Orange King..... Kinne Cleveland Co., Walpole	98.50	.05	1.45	—	Fair	Fair	Low percentage of singles; 2 plants with yellow flowers
627	Orange King..... Henry L. Sawyer Hardware Co., Newtonville	98.59	.01	.93	.47	Good	Fair	Variations in color
687	LAKE SHORE SEED CO., Dunkirk, N. Y. French Mixed Colors..... Charles W. Burch, Provincetown	93.26	.13	6.61	—	Fair	Satisfactory	
663	VAUGHAN, Chicago, Ill. Orange Shaggy..... H. V. Lawrence, Falmouth	97.99	.29	1.72	—	Good	Satisfactory	Little variation in color

## CANDYTUFT

626	CHARLES C. HART SEED CO., Wethersfield, Conn. Dwarf Hybrids, Finest Mixed Colors..... Henry L. Sawyer Hardware Co., Newtonville	99.57	.11	.32	—	Good	Satisfactory	Low percentage of whites
674	LAKE SHORE SEED CO., Dunkirk, N. Y. White..... C. L. Goodspeed, Dennis	99.67	—	.24	.09	None		Failed to germinate in green- house test
675	Finest Mixed..... C. L. Goodspeed, Dennis	99.13	.11	.57	.19	None		Failed to germinate in green- house test
642	NEW ENGLAND TORO CO., West Newton Giant White Hyacinth Flowered..... New England Toro Co., West Newton	99.93	—	.07	—	Good	Satisfactory	9% small-flowered
174	ROSS BROS. CO., Worcester Mixed..... Newton Flower Shop, Newtonville	98.98	.07	.69	.26	Good	Satisfactory	Low percentage of whites

TABLE 2. FLOWER SEED INSPECTION—Continued

Lab. No.	Variety and Source	Purity Tests*				Tests of Performance**		
		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi-nation	Performance	Remarks
664	VAUGHAN, Chicago, Ill. Giant White Hyacinth H. V. Lawrence, Falmouth	99.70	—	.30	—	Poor		42% small-flowered
	CARNATIONS AND PINKS							
651	THOMAS W. EMERSON CO., Boston Marguerite Carnations Pebecco Hardware Co., Wellesley	98.94	.09	.97	—	Good		Had not flowered on Oct. 27 1936
660	FERRY-MORSE SEED CO., Detroit, Mich. Heddwig's Single Mixed Pinks Allen Hardware Co., Needham	97.24	.27	2.38	.11	Good	Satisfactory	Good variety of colors
694	LAKE SHORE SEED CO., Dunkirk, N. Y. Extra Fine Mixed Carnations C. L. Burch, Provincetown	97.65	—	1.74	.61	None		Failed to germinate in greenhouse test
	COCKSCOMB							
615	FREDONIA SEED CO., Fredonia, N. Y. Finest Mixed Robinson's Market, Ayer	99.14	—	.77	.09	Good	Satisfactory	Mixture of Argentea and Cris-tata types
688	LAKE SHORE SEED CO., Dunkirk, N. Y. Celosia Dwarf Mixed Charles W. Burch, Provincetown	99.11	—	.81	.08	Good	Unsatisfactory	Not dwarf. Height, 24"—42"
	COREOPSIS							
632	FERRY-MORSE SEED CO., Detroit, Mich. Lanceolata grandiflora C. Skelton Hardware Co., Newtonville	95.98	—	4.02	—	Good	Satisfactory	Perennial; did not bloom first season
670	NORTHROP, KING & CO., Minneapolis, Minn. Calliopsis, Fine Mixed Smallhoff & Haines, Hyannis	97.02	.12	2.75	.11	Poor	Fair	Good Mixture

		COSMOS				
193	FRAZER'S Wellesley Orange Flare..... H. A. Spear & Son, Walpole	99.27	—	.73	—	Good
614	FREDONIA SEED CO., Fredonia, N. Y. Finest Mixed..... Robinson's Market, Ayer	97.08	.01	2.80	.11	Good
655	JOSEPH BRECK & SONS, INC., Boston Blue Lace Flower, Light Blue Caerulea..... The Garden Shop, Wellesley	99.66	—	.34	—	Fair
653	JOSEPH BRECK & SONS, INC., Boston African Daisy, Orange (Dimorphothea aurantiaca) No. 5905 The Garden Shop, Wellesley	98.34	—	1.66	—	Good
692	LAKE SHORE SEED CO., Dunkirk, N. Y. California Poppy..... C. L. Burch Co., Provincetown	99.05	.16	.64	.15	Good
649	THOMAS W. EMERSON CO., Boston Forget-me-not (Myosotis)..... Pebecco Hardware Co., Wellesley	98.66	—	1.30	.04	Good
634	CHARLES C. HART SEED CO., Wethersfield, Conn. Forget-me-not, Blue (Myosotis)..... Waverly Hardware Co., West Newton	93.37	.04	3.38	.21	Good
629	ROSS BROS. CO., Worcester Four O'Clock, Mixed..... Newton Flower Shop, Newtonville	98.72	—	1.28	—	Fair
618	LAKE SHORE SEED CO., Dunkirk, N. Y. Summer Cypress or Burning Bush..... Littleton Coal & Grain Co., Littleton	99.21	.07	.39	.33	None
607	NORTHROP, KING & CO., Minneapolis, Minn. Dark Blue..... F. W. Woolworth Co., Concord	99.57	—	.43	—	Poor

## DIMORPHOTHECA

## ESCHSCHOLTZIA

## FORGET-ME-NOT

## FOUR O'CLOCK

## KOCHIA

## LARKSPUR

Failed to germinate in green-house test

Unsatisfactory

Poor

.43

—

99.57

NORTHROP, KING &amp; CO., Minneapolis, Minn.

Dark Blue

F. W. Woolworth Co., Concord

Littleton Coal &amp; Grain Co., Littleton

Summer Cypress or Burning Bush

LAKE SHORE SEED CO., Dunkirk, N. Y.

99.21

.07

.39

.33

None

—

Fair

Good mixture of colors

Satisfactory

Biennial; did not bloom first season

Biennial; did not bloom first season

Satisfactory

Satisfactory

Good mixture of colors

Biennial; did not bloom first season

Satisfactory

Fair

Good

TABLE 2. FLOWER SEED INSPECTION—Continued

Lab. No.	Variety and Source	Purity Tests*				Tests of Performance**	
		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination	Performance Remarks
637	Mixed colors Waverly Hardware Co., West Newton	99.20	.09	.63	.08	Poor	Unsatisfactory
654	JOSEPH BRECK & SONS, INC., Boston Lobelia compacta, Crystal Palace Blue, No. 6112 The Garden Shop, Wellesley	99.23	—	.77	—	None	Good germination in greenhouse test
661	MANDEVILLE & KING, Rochester, N. Y. King Lupine, New Giant, All colors Allen Hardware Co., Needham	99.10	.04	.14	.72	Good	Did not bloom
608	NORTHROP, KING & CO., Minneapolis, Minn. Blue Bonnet (Lupinus subcarneus) Blue F. W. Woolworth, Concord	98.90	—	2.10	—	None	Failed to germinate in greenhouse test
250	BARTLETT & DOW CO., Lowell Guinea Gold Bartlett & Dow Co., Lowell	98.97	—	1.03	—	Fair	Satisfactory
213	FERRY-MORSE SEED CO., Detroit, Mich. Guinea Gold Taunton Hardware Co., Taunton	83.56	.46	15.88	.41	Fair	Satisfactory
624	Guinea Gold C. Skelton Hardware Co., Newton Center	85.88	.14	13.98	—	Fair	Satisfactory
194	FRASER'S, Wellesley French Dwarf H. A. Spear & Son, Walpole	90.32	—	9.68	—	Poor	Unsatisfactory
676	LAKE SHORE SEED CO., Dunkirk, N. Y. Tail African C. L. Goodspeed, Dennis	84.30	.13	14.63	.94	Poor	Unsatisfactory





TABLE 2. FLOWER SEED INSPECTION—Continued

Lab No.	Variety and Source	Purity Tests*				Tests of Performance**	
		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi-nation	Performance Remarks
612	CHARLES C. HART SEED CO., Wethersfield, Conn. Golden Gleam, Sweet Scented Double..... C. K. Houghton, Littleton	99.22	—	.78	—	Good	Satisfactory
685	LAKE SHORE SEED CO., Dunkirk, N. Y. Dwarf Nasturtium, Choice Mixed..... Charles W. Burch, Provincetown	98.49	—	1.12	.39	Poor	Unsatisfactory
644	FRASER'S, Wellesley Fancy Trimardeau..... Wellesley Cooperative Hardware Co., Wellesley	99.74	—	.26	—	Good	Satisfactory Good variety of colors
616	CHARLES C. HART SEED CO., Wethersfield, Conn. Balcony Blue..... Montgomery Hardware Co., Ayer	98.33	—	1.67	—	Good	Satisfactory High percentage true to color
662	MANDEVILLE & KING, Rochester, N. Y. Rose of Heaven..... Allen Hardware Co., Needham	99.03	—	.97	—	Fair	Satisfactory High percentage true to color
672	Hybrida, All Colors..... Smallhoff & Haines, Hyannis	99.01	.05	.82	.12	Good	Satisfactory Good variety of colors
636	NORTHROP, KING & CO., Minneapolis, Minn. Blue..... Waverly Hardware Co., West Newton	99.31	.06	.63	—	Good	Satisfactory High percentage true to color
671	FERRY-MORSE SEED CO., Detroit, Mich. Double Choice Mixed..... Smallhoff & Haines, Hyannis	97.40	.01	2.59	—	Good	Satisfactory Somniferum group; 70% doubles
684	Iceland, Nudicaule, Sunbeam Mixed..... J. D. Hilliard, Provincetown	99.95	—	.05	—	Good	Satisfactory Nudicaule group; not an annual

173	ROSS BROS. CO., Worcester Shirley Mixed..... Newton Flower Shop, Newtonville	99.40	.03	.57	—	Good	Satisfactory	Good strain; no traces of black
677	CHARLES C. HART SEED CO., Wethersfield, Conn. Single Mixed Colors..... H. T. Crocker, Brewster	99.50	.03	.42	.05	Good	Satisfactory	Good variety of colors
628	ROSS BROS. CO., Worcester Single Mixed..... Newton Flower Shop, Newtonville	98.18	—	1.76	.06	Good	Satisfactory	Good variety of colors
621	CHARLES C. HART SEED CO., Wethersfield, Conn. Flowering Sage..... Montgomery Hardware Co., Ayer	99.06	—	.66	.28	Poor	Unsatisfactory	
665	VAUGHAN, Chicago, Ill. Peach Blossom..... H. V. Lawrence, Falmouth	94.65	—	5.35	—	Poor	Unsatisfactory	
613	FERRY-MORSE SEED CO., Detroit, Mich. Fine Mixed..... Allen Hardware Co., Needham	97.94	.04	2.02	—	Good	Satisfactory	Good variety of colors
657	MANDEVILLE & KING, Rochester, N. Y. Yellow..... Needham Hardware Co., Needham	98.97	.40	.63	—	Good	Unsatisfactory	20 % other colors
604	LAKE SHORE SEED CO., Dunkirk, N. Y. Double Chrysanthemum-flowered..... Vanderhoof Hardware Co., Concord	99.99	—	.01	—	Very poor	Unsatisfactory	One plant; common single
610	LAKE SHORE SEED CO., Dunkirk, N. Y. Choice Mixed..... C. K. Houghton, Littleton	99.93	—	.07	—	Poor	Unsatisfactory	Seed sown too late for good results
611	Lavender..... C. K. Houghton, Littleton	100.00	—	—	—	Poor	Unsatisfactory	Seed sown too late for good results
609	NORTHROP, KING & CO., Minneapolis, Minn. Lavender Spencer..... F. W. Woolworth, Concord	100.00	—	—	—	Poor	Unsatisfactory	Seed sown too late for good results

TABLE 2. FLOWER SEED INSPECTION—Concluded

Lab. No.	Variety and Source	Purity Tests*				Tests of Performance**		
		Pure Seed %  	Weed Seed %  	Inert Matter %  	Other Crop Seed %  	Germi- nation	Performance	Remarks
		SWEET SULTAN						
673	LAKE SHORE SEED CO., Dunkirk, N. Y. Mixed Colors..... C. L. Goodspeed, Dennis	95.15	.12	1.99	2.74	Fair	Unsatisfactory	Few flowers produced
		VERBENA						
678	FERRY-MORSE SEED CO., Detroit, Mich. Hybrida, Fine Mixed..... H. T. Crocker, Brewster	95.87	.80	3.33	—	Good	Satisfactory	Good variety of colors
635	CHARLES C. HART SEED CO., Wethersfield, Conn. Hybrida, Best Mixture..... Waverly Hardware Co., West Newton	98.09	.34	1.21	.36	Good	Satisfactory	Good variety of colors
		ZINNIA						
236	THOMAS W. EMERSON CO., Boston Fantasy..... C. B. Coburn, Lowell	98.35	—	1.60	.05	Fair	Fair	54 % Fantasy Type
227	FERRY-MORSE SEED CO., Detroit, Mich. Dahlia Flowered Rose..... Whitcomb & Carter, Beverly	98.32	—	1.68	—	Fair	Fair	60 % Dahlia Flowered Type, low percentage off color
625*	Dahlia Flowered Rose (Exquisite). C. Skelton Hardware Co., Newton Center	96.55	—	3.45	—	Fair	Satisfactory	Low percentage off color
633	Dahlia Flowered Red (Crimson Monarch). C. Skelton & Son, Newtonville	98.02	—	1.98	—	Good	Fair	54 % Dahlia Flowered Type, low percentage off color
190	FRASER'S, Wellesley Giant Double Scarlet..... H. A. Spear & Sons, Walpole	99.98	—	.02	—	Fair	Fair	58 % Giant Double Type, low percentage off color
646	Giant Double Orange..... Wellesley Cooperative Hardware Co., Wellesley	99.70	—	.30	—	Good	Fair	54 % Giant Double Type, low percentage off color

209	MANDEVILLE & KING CO., Rochester, N. Y. Fantasy, All Colors.....	98.90	—	1.10	—	Good	Fair	54 % Fantasy Type
	Cobb, Bates & Yerxa, Taunton							
586	Dahlia Flowered Orange..... Kinne-Cleveland Co., Walpole	96.57	—	3.43	—	Fair	Satisfactory	70 % Dahlia Flowered Type, low percentage off color
656	California Giant Red..... Needham Hardware Co., Needham	98.88	—	1.12	—	Fair	Unsatisfactory	Variety of Colors
605	NORTHRUP, KING & CO., Minneapolis, Minn. Giant Double Rose..... F. W. Woolworth Co., Concord	97.79	—	2.21	—	Fair	Fair	52 % Giant Double type, mixed colors
639	NEW ENGLAND TORO CO., West Newton Giant Dahlia Flowered Oriole, No. 3470..... New England Toro Co., West Newton	97.46	—	2.54	—	Good	Fair	59 % Dahlia Flowered Type, low percentage off color
667	VAUGHAN, Chicago, Ill. Dahlia Flowered Oriole..... H. V. Lawrence, Falmouth	99.02	—	.98	—	Good	Satisfactory	73 % Dahlia Flowered Type low percentage off color







**MASSACHUSETTS**  
**AGRICULTURAL EXPERIMENT STATION**

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**CONTROL SERIES**

**BULLETIN No. 87**

**DECEMBER, 1936**

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**Inspection of Agricultural  
Lime Products**

**By H. D. Haskins**

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This is the twenty-fifth report on the inspection of agricultural lime products in Massachusetts. It gives the composition of the various products which have been sold in the State during the year. In case of the ground limestone products the mechanical analysis is also given.

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Massachusetts State College  
Amherst, Mass.



# INSPECTION OF AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1936

By H. D. Haskins, Official Chemist<sup>1</sup>

## Manufacturers and Brands

During 1936, 23 firms registered for sale in Massachusetts 50 brands of lime products, advertised and sold for neutralizing acid soils, one brand of gypsum or land plaster, and one brand of agricultural talc. The products are grouped as follows:

Hydrated or slaked lime . . . . .	27
Ground limestone . . . . .	21
Oyster shell lime . . . . .	1
Lime ashes . . . . .	1
<hr/>	
Total . . . . .	50
Gypsum . . . . .	1
Talc . . . . .	1

All of the lime products registered in Massachusetts during the year were sampled and analyzed and the results appear in this bulletin. Most of the samples were secured by the same agents who drew the samples for the fertilizer inspection and were taken from all parts of the State during a ten weeks' period following April 1. The samples numbered 124, representing 53 brands, and were drawn from stock in the possession of 97 agents or owners. There were 57 analyses made.

One product not registered in the State during 1936 has been included in the analyses: Gibsonburg Hi Lime, manufactured by the Gibsonburg Lime Products Co., Gibsonburg, Ohio. This material was found on sale at the S. S. Kresge Company's store in Boston. When informed that registration was necessary, the product was withdrawn from sale by the manufacturer. It had been sold only in small packages for general use and only a few packages had been disposed of.

## Variations and Deficiencies in the Composition of Lime Products.

No attempt has been made in the tables of analyses to segregate the high calcium from the high magnesium products. Both high calcium and high magnesium materials are found among the limestones as well as among the hydrated limes and are effective as neutralizing agents when applied to soil. The cost of the high magnesium products is usually about the same as for the high calcium products. The former has the higher neutralizing value and of course supplies magnesium in available form, this being of considerable importance when used on soils deficient in available magnesia.

About 79 per cent of the lime products analyzed showed no deficiencies. In case of the ground unburned products (limestone and shell lime) which showed deficiencies, with one exception the low test was accompanied by a sufficient

<sup>1</sup>Assisted by H. Robert DeRose, Albert F. Spelman, Assistant Chemists, James T. Howard, C. L. Whiting and G. E. Taylor, Sampling Agents.

overrun in the other ingredient (calcium or magnesium according to the deficiency) so that there was no decrease in neutralizing value. The exception was Monarque Agricultural Dolomite, manufactured by Clifford L. Miller. This product was found deficient .91 per cent in calcium oxide and .74 per cent in magnesium oxide, or a net deficiency of 1.94 per cent in calcium oxide equivalent.

Several of the unburned lime products should be more finely ground to become as effective as is the hydrated product when used in amounts to furnish the equivalent of calcium and magnesium oxides. The following products would be more effective in neutralizing soil acidity if more finely ground. The finer grinding of unburned lime products means a greater surface exposed to chemical action in the soil, with a corresponding increase in availability.

Magnesium Limestone, American Agricultural Chemical Co.

Ground Limestone, Hazen Brothers.

Hoosac Agricultural Limestone, Hoosac Valley Lime Co., Inc.

Monarque Agricultural Dolomite, Clifford L. Miller.

Monarque Agricultural Limestone, Clifford L. Miller.

Sealshipt Oyster Shell Lime, Producers Sales Co.

Ashley White Dolomite Agricultural Limestone, D. U. Smith & Brother.

Solvay Pulverized Limestone, Solvay Process Co.

What has been said with reference to deficiencies in the unburned lime products applies also to the hydrated limes. Although calcium oxide deficiencies were noted in seven brands, yet all of these were accompanied by sufficient overruns in magnesium oxide so that the net value of the products was not impaired. One brand, Gibsonburg Hi Lime, manufactured by Gibsonburg Lime Products Co., showed a deficiency of .69 per cent calcium oxide and .52 per cent magnesium oxide or a net deficiency of 1.55 per cent in calcium oxide equivalent.

### Explanation of Tables of Analyses

Table I, "Proportion of total oxides as carbonates." The data furnished in this column are calculated from an actual determination of carbon dioxide ( $\text{CO}_2$ ). Calcium or magnesium not in the form of carbonate is present either as hydrated lime (water- or air-slaked), burned lime (caustic or unslaked), or as basic silicate. All of the products listed in this table have at some time been burned, and the proportion of oxides present as carbonates indicates to what extent the product has absorbed carbonic acid from the air.

Table II, "Carbonates of calcium and magnesium." The calculation in this column allows for the small amounts of calcium and magnesium combined as basic silicates; these are readily soluble in mineral acid solutions but obviously should not be classed as carbonates.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass the various meshed sieves mentioned.

Tables I and II. "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "per cent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid has been added.

The figures in parenthesis following the brand name show the number of samples collected and analyzed.

Table 1. Hydrated or Slaked Lime.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO).		Proportion of Total Oxides as Car- bonates.	NEUTRALIZING VALUE EXPRESSED IN TERMS OF CALCIUM OXIDE.		Insoluble Matter.
	Found.	Guar- anteed.	Found.	Guar- anteed.		Per Cent.	Pounds in One Ton.	
<b>Brewer &amp; Co., Inc., 45 Arctic St., Worcester, Mass. (a)</b>								
Green Mountain Handy Hydrated Lime (1)	68.81	65.00	3.91	1.00	1/8	73.01	1,460	2.75
Snow Fluff Agricultural Hydrate (1)	69.94	70.00	5.33	5.00	1/19	75.72	1,514	2.45
Producto Agricultural Lime (1)	82.00	60.00	7.00	1.00	1/13	90.09	1,802	3.50
Sure Crop Agricultural Hydrate (1)	67.02	65.00	1.59	1.00	1/3	69.03	1,381	2.96
Lime Kiln Ashes (1)	48.65	42.00	4.26	none	3/5	53.48	1,070	11.10
<b>Eastern States Farmers' Exchange, Springfield, Mass. (b)</b>								
Eastern States Magnesian Hydrated Lime (1)	48.10	47.00	33.74	31.00	1/17	91.84	1,837	.85
<b>Gibsonburg Lime Products Co., Gibsonburg, Ohio.</b>								
Gibsonburg Hi Lime (1)	46.93	47.62	33.00	33.62	1/10	89.24	1,785	.33
<b>Harris Lime Co., Saylesville, R. I. (c)</b>								
Harris High Magnesium Agricultural Hydrated Lime (3)	51.68	50.00	24.39	22.00	1/7	84.26	1,685	2.79
<b>A. H. Hoffman, Inc., Landisville, Penn.</b>								
Hoffman's Hydrated Lime (2)	68.96	70.00	2.67	1.50	1/5	70.88	1,418	2.40
<b>Hoosac Valley Lime Co., Inc., Adams, Mass.</b>								
Adams Land Lime (1)	60.61	60.00	2.33	.50	1/5	62.62	1,252	6.48
<b>Kelley Island Lime &amp; Transport Co., 1122 Leader Building, Cleveland, Ohio.</b>								
Tiger Hydrated Lime (1)	47.01	47.12	34.51	34.14	1/12	91.23	1,825	.19
<b>Lawrence Portland Cement Co., Thomaston, Maine.</b>								
Dragon Mainrok Agricultural Hydrated Lime (1)	69.33	65.00	1.39	.20	1/9	68.32	1,366	1.72
Dragon Mainrok Land Lime (2)	70.08	60.00	1.52	.20	1/10	70.10	1,402	1.52
<b>Lee Lime Corp., Lee, Mass.</b>								
Lee Agricultural Hydrated Lime (5)	47.75	47.00	32.84	31.00	1/6	90.38	1,808	1.25
Lee Land Lime (3)	43.49	35.00	30.56	25.00	3/10	83.97	1,679	1.01

# **H. E. Millard, Annaville, Penn.**

Sweet-Arrow Hydrated Lime (3)	69.27	70.00	2.64	1.50	1/11	71.45	1,429	2.00
<b>Clifford L. Miller, West Stockbridge, Mass.</b>								
Monarque Agricultural Hydrated Lime (3)	63.37	60.00	8.66	4.00	1/13	74.72	1,494	3.66
<b>New England Lime Co., Adams, Mass. (d)</b>								
Nelco Agricultural Hydrated Lime (Adams) (1)	72.54	70.00	1.85	.50	1/25	74.01	1,480	1.00
Nelco Agricultural Hydrated Lime (Canaan) (3)	46.75	47.00	32.49	30.00	1/17	89.67	1,793	1.66
Nelco Land Lime (Canaan) (2)	44.58	35.00	30.56	25.00	1/5	84.83	1,697	1.18
<b>Rockland-Rockport Lime Co., Inc., Rockland, Maine.</b>								
R-R Land Lime Grade C (2)	61.28	60.00	1.98	.50	2/5	62.62	1,252	4.12
R-R Land Lime Grade M (3)	57.61	60.00	6.35	4.00	2/5	64.33	1,287	5.70
Sanlime (1)	69.27	70.00	2.57	.20	1/7	70.88	1,418	.60
R-R Land Lime Special High Magnesia (2)	49.18	40.00	27.39	22.00	1/3	84.26	1,685	5.15
Rockland Agricultural Hydrated High Magnesium Lime (1)	49.24	45.00	26.67	23.00	1/3	83.12	1,662	1.60
<b>United States Gypsum Co., 300 West Adams St., Chicago, Ill. (e)</b>								
U.S.G. Agricultural Hydrate from Farnams Mill (3)	70.97	70.00	2.01	none	1/17	71.73	1,435	1.93
Red Top Agricultural Hydrated Lime (2)	71.29	70.00	1.61	trace	1/9	72.30	1,446	.95
Red Top Agricultural Hydrated from Genoa, Ohio (1)	47.77	47.00	32.90	30.00	1/8	90.52	1,810	.50
U.S.G. Agricultural Land Lime from Farnams Mill (2)	68.49	60.00	1.70	none	1/6	69.88	1,398	1.97

<sup>a</sup>Plant at Winooski, Vt.

<sup>b</sup>Plant at Falls Village, Conn.

<sup>c</sup>Shipping point Berkeley, R. I.

<sup>d</sup>Plants at Adams, Mass., and Canaan, Conn.

<sup>e</sup>Plants at Farnams, Mass., and Falls Village, Conn.

Table II. Ground Limestone and Oyster Shell Lime.

NAME OF MANUFACTURER AND BRAND.	CALCIUM OXIDE (CaO).		MAGNESIUM OXIDE (MgO.)		CARBONATES OF CALCIUM AND MAGNESIUM		NEUTRALIZING VALUE EXPRESSED IN TERMS OF CALCIUM OXIDE		INSOL- UBLE MATTER	MECHANICAL ANALYSIS (PER CENT)			
	Found.	Guar- anteed.	Found.	Guar- anteed.	Found.	Guar- anteed.	Per Cent.	Pounds In One Ton.		Finer than 100-mesh	Between 100 and 80-mesh	Between 80 and 40-mesh	Between 40 and 20-mesh
American Agricultural Chemical Co., North Weymouth, Mass.													
Fine Ground Magnesium Limestone (2) (a)	30.47	30.00	20.60	20.00	97.45	95.00	58.24	1,165	2.12	46.43	3.03	31.93	18.61
Powall Agricultural Limestone (5) (b)	45.77	45.00	6.50	5.00	93.87	90.00	53.58	1,072	5.27	68.50	7.46	15.03	9.01
Dominion Lime Co., Lime Ridge, Quebec. (c)													
Dudswell Brand Agricultural Limestone (1)	51.62	52.00	1.25	.20	92.12	94.00	51.59	1,032	6.67	94.60	.55	4.85	none
Eastern States Farmers' Exchange, Springfield, Mass. (d)													
Eastern States Magnesium Limestone (4)	30.22	29.00	20.70	20.00	96.17	93.50	57.67	1,153	3.24	80.16	2.70	14.02	3.12
Grangers Manufacturing Co., West Stockbridge, Mass.													
Grangers Agricultural Limestone (3)	40.41	30.00	7.84	1.00	86.06	90.00	49.81	996	12.57	68.37	6.81	19.55	5.27
Hazen Brothers, 14 Parker St., Arlington, Mass.													
Ground Limestone (3)	53.14	53.52	.87	.51	96.65	98.20	53.58	1,072	2.55	49.38	2.50	29.22	18.90
Ground Limestone (4)	53.45	54.00	1.02	.51	97.57	98.20	54.08	1,082	1.52	29.05	7.65	36.15	27.15
Ground Limestone (1)	53.97	53.52	1.01	.51	98.42	98.20	54.29	1,086	1.27	32.48	10.14	46.21	11.17
Hoosac Marble Co., North Adams, Mass.													
Ground Limestone (2)	53.40	53.00	.91	.65	95.29	96.44	53.05	1,061	3.80	75.08	12.19	12.19	.54
Hoosac Valley Lime Co., Inc., Adams, Mass.													
Hoosac Agricultural Limestone (2)	54.24	50.00	.81	.50	97.17	97.00	54.29	1,086	2.20	33.43	4.60	25.09	36.88
Lawrence Portland Cement Co., Thomaston, Maine.													
Dragon Mainrok High Calcium Pulverized Lime- stone (2)	53.95	50.00	1.05	.20	98.47	95.00	54.40	1,090	1.32	99.87	.06	.07	none
Dragon Mainrok Dolomite Pulverized Limestone (2)	26.05	25.00	15.91	15.00	75.81	78.00	45.08	902	22.10	99.04	.70	.26	none

<b>Lee Lime Corp., Lee, Mass.</b> Lee Agricultural Pulverized Limestone (4) Lee Agricultural Pulverized Limestone (3)	30.46 31.31	30.00 30.00	22.07 21.27	20.00 20.00	97.38 97.28	93.00 93.00	59.67 58.85	1.193 1.177	1.12 1.25	76.20 74.00	6.25 4.61	14.07 17.08	3.48 4.31
<b>Limestone Products Corporation of America, Newton, N. J.</b> Lime Crest Brand Pulverized Limestone (3)	46.75	34.00	5.44	1.00	93.31	90.00	52.65	1.053	5.90	79.79	4.62	11.91	3.68
<b>Clifford L. Miller, West Stockbridge, Mass.</b> Monarque Agricultural Dolomite (2) Monarque Agricultural Limestone (1)	29.09 38.50	30.00 35.00	17.26 11.75	18.00 5.00	87.00 92.68	90.00 90.00	51.84 53.37	1.037 1.067	12.47 7.02	66.92 68.93	2.10 1.63	10.57 10.55	20.41 18.89
<b>New England Lime Co., Adams, Mass.</b> Nelco Agricultural Ground Limestone (Canaan) (1) Nelco Agricultural Ground Limestone (Adams) (1)	30.53 52.62	30.00 50.00	21.03 1.05	20.00 none	98.46 96.10	92.00 95.00	59.06 53.65	1.181 1.073	.97 3.32	79.01 95.59	3.49 .64	13.90 3.00	3.60 .77
<b>Producers Sales Co., 144 Water St., South Norwalk, Conn.</b> Sealshipt Brand Oyster Shell Dust (1)	46.59	45.00	.83	.75	84.88	77.00	46.94	.939	9.77	48.16	6.19	30.61	15.04
<b>Rockland-Rockport Lime Co., Inc., Rockland, Maine.</b> R-R Grade C Ground Limestone (1) R-R Grade M Ground Limestone (2)	49.97 33.41	48.00 30.00	3.03 18.64	1.00 17.00	94.33 98.60	92.00 94.00	52.30 58.06	1.046 1.161	5.01 1.19	79.35 78.73	3.83 5.02	13.03 14.63	3.79 1.62
<b>D. U. Smith &amp; Brother, Ashley Falls, Mass.</b> Ashley White Dolomite Agricultural Limestone (2)	30.53	30.00	21.11	21.00	97.23	98.00	57.99	1.160	1.92	43.77	4.19	29.60	22.44
<b>Solvay Process Co., Syracuse, N. Y.</b> Solvay Pulverized Limestone (1)	48.45	50.00	3.00	1.50	92.73	92.40	51.30	1.026	6.73	41.24	12.91	18.18	27.67
<b>United States Gypsum Co., 300 West Adams St., Chicago, Ill.</b> U.S.G. Agricultural Limestone (Falls Village, Conn.) (2) U.S.G. Agricultural Limestone (Falls Village, Conn.) (4)	30.88 31.50	29.00 29.00	20.33 19.86	20.00 20.00	96.99 97.74	93.50 93.50	57.89 58.86	1.158 1.177	2.71 1.94	81.89 82.24	3.15 3.39	13.95 11.27	1.01 3.10

a Plant at Ashley Falls, Mass.

Plant at North Pownal, Vt.

Plant at North Trowan, Vt.  
Plant at Dudswell Junction, Quebec, Canada.

Plant at Falls Village, Conn.

Table III. Gypsum or Land Plaster.

Name of Manufacturer and Brand	Calcium Oxide (CaO).		Calcium Sulfate (CaSO <sub>4</sub> ).		Calcium and Magnesium Carbonates Found.
	Found.	Guaranteed.	Found.	Guaranteed.	
United States Gypsum Co., 300 West Adams St., Chicago, Ill. Ben Franklin Agricultural Gypsum (2)	32.53	30.00	71.90	64.50	6.15

## Howard's Agricultural Talc

Registered by L. A. Howard Talc Co., Inc., Proctorsville, Vermont.

This material was analyzed at this laboratory in considerable detail late in 1935. The results of this analysis are given herewith as it furnishes a better picture of the actual composition and behavior of the material than does a later analysis of a sample secured by our inspector in 1936 which was simply analyzed for its content of acid soluble calcium and magnesium oxides in order to check the acid soluble magnesium oxide which was guaranteed under registration.

*Analysis in 1935*  
*Per Cent.*

## By fusion:

Magnesium oxide . . . . .	32.64
Calcium oxide . . . . .	1.24
Iron and aluminum oxides . . . . .	9.12
Insoluble siliceous material . . . . .	41.05

## By dilute 1-1 hydrochloric acid:

Magnesium oxide . . . . .	13.87
Calcium oxide . . . . .	1.19
Iron and aluminum oxides . . . . .	5.21
Insoluble matter . . . . .	64.72
Volatile matter (largely carbon dioxide) . . . . .	15.02

In order to test the solubility of the magnesium contained in the talc, various solvents were used and the recovery of magnesium oxide is given as follows:

*Magnesium Oxide*  
*Recovered*  
*Per Cent.*

½ Gram boiled with 150 cc. distilled water made slightly acid with hydrochloric acid + 15 cc. of saturated solution of ammonium oxalate . . . . .	5.58
1 Gram boiled 5 minutes with 100 cc. of 1% hydrochloric acid . . . . .	8.87
1 Gram boiled with 100 cc. of 1% hydrochloric acid + 5 grams of ammonium chloride . . . . .	13.13
1 Gram boiled with 200 cc. of 2% citric acid solution . . . . .	5.52

The product was used in a trial experiment on a farm in Leverett, Mass., on soil with a pH of 4.8, showing the characteristic chlorosis accompanying magnesia deficiency. The crops were potatoes, corn and oats. The application of 400 to 600 pounds per acre prevented the chlorosis.

The analysis of the sample drawn in the spring of 1936, strong hydrochloric acid being used as the solvent, gave the following results:

	<i>Found</i> <i>Per Cent.</i>	<i>Guaranteed</i> <i>Per Cent.</i>
Magnesium oxide . . . . .	20.96	13.00
Calcium oxide . . . . .	1.80	
Iron and aluminum oxides . . . . .	8.40	
Insoluble material . . . . .	44.76	

Tests made at this laboratory on other samples show the presence of considerable carbon dioxide, indicating that the product is not a true talc (silicate of magnesia) but rather a mixture of talc and magnesite (carbonate of magnesia).

### Lime Definitions

The following definitions of lime products used in agriculture were made official by vote of the Association of Official Agricultural Chemists at their annual meeting in December 1936. It is hoped that so far as possible the branding of lime products used in agriculture will be made to conform to these definitions. This office will be glad to cooperate with any manufacturer in advising with reference to necessary changes in order to conform to these definitions.

1. **Air-slaked lime.** A product composed of variant proportions of the oxide, hydroxide and carbonate of calcium, or calcium and magnesium, and derived from exposure of quicklime.

2. **Pulverized limestone, (fine-ground limestone)** is the product obtained by grinding either calcareous or dolomitic limestone so that all of the material will pass a 20-mesh sieve and at least seventy-five (75%) per cent will pass a 100-mesh sieve.

3. **Ground limestone, (coarse-ground limestone)** is the product obtained by grinding either calcareous or dolomitic limestone so that all of the material will pass a 10-mesh sieve, and at least fifty per cent (50%) will pass a 100-mesh sieve.

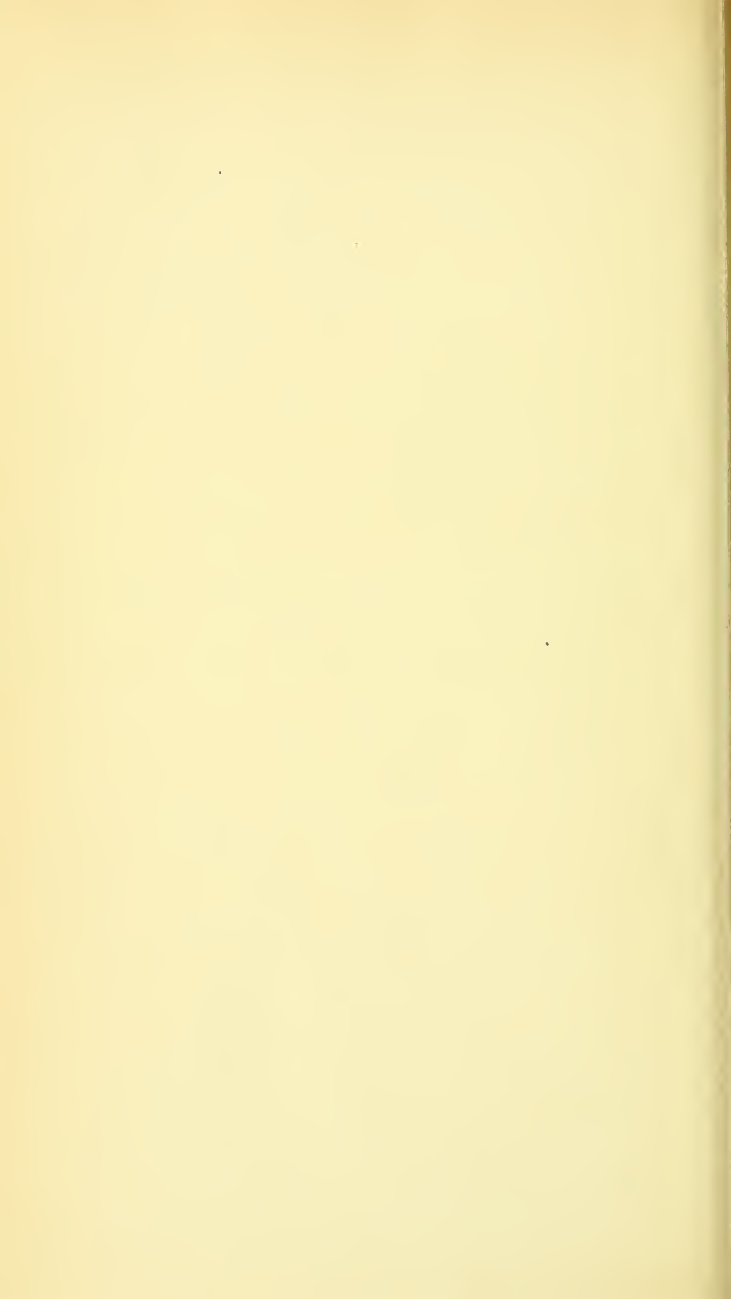
4. **Ground shells** is the product obtained by grinding the shells of mollusks so that not less than fifty per cent (50%) shall pass a 100-mesh sieve. The product shall also carry the name of the mollusk from which said product is made.

5. **Ground shell marl** is the product obtained by grinding natural deposits of shell marl so that at least seventy-five per cent (75%) shall pass a 100-mesh sieve.









# MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 88

JUNE, 1937

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## Seventeenth Annual Report on Eradication of Pullorum Disease in Massachusetts

By the Poultry Disease Control Laboratory

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This bulletin reports the results of pullorum-disease testing for the 1936-37 season. The results show that pullorum disease eradication is steadily progressing in Massachusetts. Marked increases in the number of tested flocks, tested birds and tested samples were observed for the season. It is encouraging to note that in spite of the large increases, the average percentage of positive tests was nearly as low as that of the previous season. Poultrymen and others interested in the industry are urged to cooperate to the fullest extent in applying sound measures that will further the eradication of the disease, as well as to employ methods which maintain flocks free from the disease.

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MASSACHUSETTS STATE COLLEGE

AMHERST, MASS.

# SEVENTEENTH ANNUAL REPORT ON PULLORUM DISEASE ERADICATION IN MASSACHUSETTS

1936-1937

By the Poultry Disease Control Laboratory<sup>1</sup>

## Introduction

The main purpose of pullorum-disease testing in Massachusetts is to identify flocks free from pullorum infection. In certain instances the test is employed as a means of eradicating the disease from flocks, especially in those flocks which warrant the expenditure for intensive retesting. However, the testing of birds is one important phase in the program for the establishment and maintenance of pullorum-clean flocks. This fact is clearly illustrated in the past season's results which show further progress in the elimination of the disease from Massachusetts flocks.

Several factors have contributed to the progress in pullorum-disease elimination, but one deserving of special mention is the fact that the majority of flock owners have experienced the advantages of a pullorum-clean flock as contrasted with the disadvantage of an infected flock. They have come to realize the value of annual testing and also the importance of preventing the disease from entering their flocks. The small number of re-infected flocks encountered annually would suggest that few poultrymen fail in their efforts to maintain a pullorum-clean flock.

Knowing that the majority of Massachusetts poultrymen recognize the value of pullorum-clean flocks and that it requires a sound eradication and prevention program to establish and maintain such flocks, the industry may entertain the fullest hope that the disease will be further eliminated from within the State.

## Summary of Service Rendered

Applications received .....	322
Applications cancelled .....	15
Flocks tested .....	311*
Number of tests .....	463,095
Chickens:—	
Routine .....	460,167
Experimental .....	1,595
Fowl other than chickens:—	
Routine .....	684
Experimental .....	649**
Owners receiving necropsy service .....	26
Necropsies of reacting birds .....	65

\* Includes four flocks of poultry other than chickens.

\*\* Includes 488 paratyphoid tests.

<sup>1</sup> Poultry Disease Control Laboratory Staff: H. Van Roekel, Chief of Laboratory; K. L. Bullis, Assistant Veterinary Pathologist; O. S. Flint, Assistant Research Professor; Miriam K. Clarke, Research Assistant; Felicia Jewett, Laboratory Assistant. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the administrative assistance given to the testing work.

TABLE 1. DISTRIBUTION OF TESTS AND REACTORS BY COUNTIES AND BY BREEDS

Breed	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hamden	Hampshire	Middlesex	Norfolk	Plymouth	Worcester	Totals	Percent Positive Tests
(Total tests														
Rhode Island Reds.....(Positive tests	11,272	5,584	36,634	43	18,416	30,115	18,757	18,361	53,096	100,795	22,441	60,881	376,395	0.33
	0	56	114	0	35	29	97	8	10	865	1	8	1,223	
(Total tests														
Barred Plymouth Rocks..(Positive tests	442	120	4,830	.....	2,333	4,491	1,382	961	10,079	7,907	4,896	3,081	40,522	0.15
	0	4	2	.....	0	0	6	0	0	21	0	26	59	
(Total tests														
White Plymouth Rocks..(Positive tests	.....	.....	1,295	36	859	.....	4	.....	2,686	1,535	8,634	615	15,664	0.61
	.....	.....	0	0	0	.....	0	.....	0	0	108	0	108	
(Total tests														
White Leghorns.....(Positive tests	.....	4,694	4,017	.....	840	.....	.....	108	.....	1,065	.....	421	11,145	1.20
	.....	133	1	.....	0	.....	.....	0	.....	0	.....	0	134	
(Total tests														
New Hampshires.....(Positive tests	.....	1,083	.....	.....	.....	8,091	160	.....	205	.....	670	5,713	15,922	1.22
	.....	62	.....	.....	.....	6	0	.....	0	.....	0	127	195	
(Total tests														
Miscellaneous.....(Positive tests	.....	2	192	.....	101	34	127	90	603	855	2	108	2,114	0.57
	.....	0	12	.....	0	0	0	0	0	0	0	0	12	
Total Tests.....	11,714	11,483	46,968	79	22,549	42,731	20,430	19,529	66,669	112,157	36,643	70,819	461,762	
(Number														
Positive Tests.....(Percent	0	255	129	0	35	35	103	8	10	886	109	161	1,731	
	0.00	2.22	0.27	0.00	0.16	0.08	0.50	0.04	0.01	0.79	0.30	0.23		0.37

## Distribution of Tests and Reactors

Table 1 gives the number of tests and reactors for each breed and each county. Twelve counties received testing service during the season. A total of 461,762 samples was tested, which is the largest number during any one season of the 17-year period. Norfolk, Worcester, and Middlesex Counties led in the number of tested samples.

The average percentage of positive tests for the State was 0.37, which is slightly higher than the previous season. This percentage was markedly increased by one flock which yielded 690 reactors. Two counties, Barnstable and Dukes, had no positive tests among the samples tested. All other counties except one had less than 1 percent positive tests.

The predominating breed tested was the Rhode Island Red, which revealed a smaller percentage of positive tests than all other breeds combined.

Of the total number of samples tested, 419,377 were from females and 42,385 from males. Of these 0.38 and 0.34 percent, respectively, were positive.

## Pullorum Disease Yields to Annual Testing

Less than 10 years ago annual testing was regarded as unnecessary, even in cases where flocks had revealed no reactors in the test of the previous season. At the present time the prevailing understanding among poultrymen in Massachusetts is that annual testing is an essential part of their husbandry program for the year, whether or not they think their flocks are free from the disease. Such an attitude on the part of the flock owner has brought about great progress in the establishment and maintenance of pullorum-clean flocks in Massachusetts. This fact is supported by data in Table 2. This table shows that 162 flocks, representing 326,435 birds and 334,366 tests, had been tested for three or more consecutive years. Of the total birds tested 72.7 percent were in the group which had been tested for three or more consecutive years. The percentage of positive tests for this group was 0.08, which is the lowest attained in the 17-year testing period. Furthermore, an increase of 63,035 birds over the previous season has been observed.

TABLE 2. ANNUAL TESTING VERSUS SINGLE AND INTERMITTENT TESTING

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100 % Tested	Partially Tested	100 % Tested	Partially Tested
Tested for the first time.....	67	48,461	50,605	430	0.85	43	14	7	3
Intermittent testing.....	36	33,671	33,671	732	2.17	24	7	2	3
Two consecutive years.....	42	39,952	43,120	314	0.73	32	4	4	2
Three or more consecutive years..	162	326,435	334,366	255	0.08	134	23	2	3
Totals.....	307	448,519	461,762	1,731	0.37	233	48	15	11

Among the other groups increases in the number of flocks and tested birds over the previous season have also been noted. The percentages of positive tests for the groups tested for the first time and tested intermittently are greater than those in the remaining groups. This is as one might expect, although the percentage of positive tests in the group tested for the first time is far less than that of the previous season. This fact is encouraging, since it gives the flock owners in this group a greater incentive to continue testing and employing measures to establish and maintain a clean flock.

A total of 281 non-reacting flocks were detected, of which 48 were tested partially. Among 281 non-reacting flocks, 157 (55.8 percent) were in the group tested for three or more consecutive years.

Twenty-six positive flocks are listed in Table 2. The group tested for the first time leads in the number of positive flocks.

Fifty-nine flocks, representing 19.2 percent of the total flocks, were partially tested. However, it is encouraging to note that the percentage of flock owners who tested all the birds on the premises has increased from 79.3 in 1935-36 to 80.7 in 1936-37. Partial flock testing, although apparently successful in some cases, as a general rule fails to determine the true status of the flock and sooner or later brings grief to the owner. The testing of all birds on the premises enables one to determine the true status of the entire flock and eliminates the necessity for quarantine measures that should be practiced in a partially tested flock. A flock once free from the disease does not necessarily continue without pullorum infection.

In discussing the data in Table 2, one may conclude that pullorum-disease eradication has made the greatest progress in flocks that are subjected to annual testing and sound eradication and preventive measures. It is hoped that further progress can be made by reducing or eliminating the number of partially tested flocks.

### Appearance of Infection in Flocks Previously Negative

In a disease eradication program the subject of infection re-appearing in previously non-reacting flocks is one of great concern to the poultry industry. According to present knowledge regarding the transmission of the disease, pullorum infection may be disseminated through numerous channels. Knowing that scattered foci of infection still exist within the State as well as out of State, dissemination of the disease to previously non-reacting flocks may be expected if proper preventive measures are not exercised.

In Table 3 are listed six flocks that were non-reacting in 1935-36 but revealed infection in 1936-37. It is of interest to note that in all cases but one the reactors did not exceed 0.50 percent. The source of infection could not be satisfactorily explained in four flocks. Flock 3 revealed infection the previous season and was retested by the pen method. It is quite possible that this method of testing failed to detect all of the infection which manifested itself in the progeny the following season. The safest retesting procedure for infected flocks is to retest all birds in the flock, which permits one to determine the true status of each individual bird. The owner of Flock 4 returned a pen of birds from an egg-laying contest and when these were tested one infected bird was detected. This incident points out, as have previous cases of a similar nature, that birds returned from egg-laying contests or shows may be infected with diseases foreign to the flock from which they originated. Therefore, one should not jeopardize the health standing of a flock by carelessly or



unthinkingly returning such birds without determining their health status. Some breeders follow the preferred policy of not returning such birds to the flock, in order to avoid the possibility of introducing diseases into the flock. In Flock 5 the explanation for infection might be the introduction of males from an unknown source. However, it is questionable whether or not infected males could bring about 11.65 percent infection in a flock. It is likely that some other factors also were operative in bringing about infection.

While the percentage (2.94) of "breaks" may appear small, it nevertheless constitutes a problem to the poultry industry. This is especially true as long as poultrymen are willing to tolerate the existence of scattered foci of infection within the State, to permit the importation of infected stock, and to neglect to carry out effective preventive measures against the introduction of the disease into the flock.

TABLE 3. APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

Flock	Number of Years Negative	1936-37 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	1	4,266	4,266	0.14	No information
		4,143	*2,427	0.00	
2	1	55,363	55,361	0.24	No definite source
		55,000	*3,901	0.00	
3	1**	4,240	4,237	0.09	No information
		4,233	*474	0.00	
4	8	1,000	999	0.10	Contest bird
		1,000	*104	0.00	
5	1	379	369	11.65	Introduced males from unknown source
6	3	6,214	6,214	0.40	No definite source
		6,214	*2,736	0.00	

\* Represents retests.

\*\* Reactors the previous season but cleaned up infection by retesting.

### Non-Reacting and Positive Flocks Classified by Counties

Table 4 shows that during the 1936-37 testing season, 281 non-reacting flocks, representing 424,431 birds, were detected. The number of birds in the non-reacting flocks represented 94.6 percent of the total birds tested. The number of 100 percent tested, non-reacting flocks was 233. The number of birds in these flocks, representing 84.4 percent of the total tested, was 378,563. Norfolk, Middlesex and Worcester Counties have the largest number of birds in non-reacting flocks.

Twenty-six flocks, representing 24,088 birds, were classified as infected. Only 5.4 percent of the total birds tested were in positive flocks.

The data in Table 4 show that Massachusetts is constantly progressing in establishing and maintaining pullorum-clean flocks. The industry should recognize its pullorum-disease-free flocks and utilize these sources to a greater

extent to replace infected flocks or establish new clean flocks. Pullorum disease eradication can be greatly enhanced through a far-reaching, effective educational program which is sponsored by all the various agencies within the industry. The values derived from pullorum disease eradication reach out into every phase of the industry; hence cooperative effort by all agencies means a stronger attack on the enemy.

TABLE 4. NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

County	100 % Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
<b>Non-Reacting Flocks</b>						
Barnstable.....	2	2,745	2	8,969	4	11,714
Berkshire.....	7	7,012	2	694	9	7,706
Bristol.....	20	34,783	8	8,446	28	43,229
Dukes.....	—	—	1	79	1	79
Essex.....	17	18,444	4	3,645	21	22,089
Franklin.....	26	38,026	1	1,173	27	39,199
Hampden.....	26	17,739	3	1,422	29	19,161
Hampshire.....	16	16,669	5	1,663	21	18,332
Middlesex.....	40	61,648	6	4,554	46	66,202
Norfolk.....	14	95,493	8	3,950	22	99,443
Plymouth.....	21	29,794	4	5,971	25	35,765
Worcester.....	44	56,210	4	5,302	48	61,512
Totals.....	233	378,563	48	45,868	281	424,431
<b>Positive Flocks</b>						
Berkshire.....	3	2,473	1	1,304	4	3,777
Bristol.....	3	2,062	3	1,203	6	3,265
Essex.....	—	—	1	460	1	460
Franklin.....	—	—	1	1,105	1	1,105
Hampden.....	1	62	1	382	2	444
Hampshire.....	1	315	—	—	1	315
Middlesex.....	1	363	—	—	1	363
Norfolk.....	—	—	4	5,933	4	5,933
Plymouth.....	2	878	—	—	2	878
Worcester.....	4	7,548	—	—	4	7,548
Totals.....	15	13,701	11	10,387	26	24,088

## Comparison of 1935-36 and 1936-37 Seasons

The results of the 1935-36 and 1936-37 testing seasons are compared in Table 5. Increases are noted in tested flocks (55), tested birds (118,860), tests (117,681) and non-reacting flocks (51). The percentage of positive tests increased slightly from 0.30 to 0.37.

TABLE 5. COMPARISON OF 1935-36 AND 1936-37 TESTING

County	Flocks	Birds	Tests	Positive Tests Percent	Non- Reacting Flocks
1935-36 Season					
Barnstable.....	2	2,544	2,544	0.00	2
Berkshire.....	8	8,257	8,257	0.13	5
Bristol.....	30	34,566	39,380	0.47	25
Essex.....	21	21,755	21,874	0.45	19
Franklin.....	22	27,510	32,794	0.79	21
Hampden.....	20	15,196	15,432	0.21	18
Hampshire.....	18	14,679	14,679	0.01	17
Middlesex.....	48	57,753	57,753	0.00	48
Norfolk.....	23	72,516	74,739	0.18	20
Plymouth.....	21	24,245	24,896	0.03	21
Worcester.....	39	50,638	51,733	0.56	34
Totals.....	252	329,659	344,081	0.30	230
1936-37 Season					
Barnstable.....	4	11,714	11,714	0.00	4
Berkshire.....	13	11,483	11,483	2.22	9
Bristol.....	34	46,494	46,968	0.27	28
Dukes.....	1	79	79	0.00	1
Essex.....	22	22,549	22,549	0.16	21
Franklin.....	28	40,304	42,731	0.08	27
Hampden.....	31	19,605	20,430	0.50	29
Hampshire.....	22	18,647	19,520	0.04	21
Middlesex.....	47	66,565	66,669	0.01	46
Norfolk.....	26	105,376	112,157	0.79	22
Plymouth.....	27	36,643	36,643	0.30	25
Worcester.....	52	69,060	70,819	0.23	48
Totals.....	307	448,519	461,762	0.37	281

## Pullorum Disease in Turkeys

During the past few years an increasing number of cases of pullorum infection in turkeys has come to our attention. Along with the expansion in turkey production by means of artificial methods which are similar to or have something in common with those used for hatching and raising chicks, pullorum-disease outbreaks have also increased in number. Such outbreaks of pullorum infection among turkeys in Massachusetts have in all cases occurred in young poults. In most cases the origin of the infection could be traced to an incubator or brooder house which was or had been occupied by pullorum-infected chicks. Spontaneous cases of pullorum infection traceable to adult turkey breeding stock have not been observed.

Turkey raisers who carry on their own hatching and brooding operations should exercise every possible precaution against introducing pullorum infection through these channels. Turkey eggs should not be incubated on the same premises where eggs or stock that harbor the infection are found. Young poults are readily susceptible to the disease, which behaves similarly to that in young chicks. The poults which survive the outbreak may remain "carriers" of the infection. These "carriers" exhibit an apparently normal physical condition, but on necropsy *S. pullorum*, causative organism of the disease, may be recovered.

During the 1936-37 testing season, the breeders in one turkey flock were tested for pullorum disease. Pullorum infection had been discovered in this group of birds when they were young poults, and limited evidence suggested that the infection originated at a custom hatchery. The breeders were tested at approximately six months of age. The following is a brief summary of the testing results.

Date of Test	No. of Turkeys Tested	Percent Reactors	Remarks
11/10/36	118	28.81	Bacteriological cultures were taken from eight birds of which three yielded <i>S. pullorum</i> .
12/ 8/36	83*	0.00	
1/13/37	82	0.00	Sera of two birds exhibited a very weak reaction in the dilutions of 1:10 and 1:25.
3/26/37	77	0.00	

\* Four samples were unsatisfactory for the agglutination test.

Among the 118 birds tested, 28.81 percent exhibited reactions which varied in degree, with a maximum titre of 1:320. The sera of the majority of the reactors completely agglutinated *S. pullorum* antigen in the 1:25 dilution.

Although it was impossible to obtain all the reacting birds for further study and necropsy, the owner cooperated in making it possible to examine a few of the reacting birds which had been dressed for the holiday trade. Cultures were taken from eight birds and *S. pullorum* was isolated from three. In one case the organism was recovered only from the peritoneum. The agglutination titres of definitely known infected birds indicate that a low diagnostic dilution is essential in detecting "carriers" of the disease.

Results of subsequent tests point out that the initial test was effective in eliminating the infected birds from the flock. No evidence of pullorum infection has been obtained in progeny raised from the tested breeders. The progeny of the tested stock will be subjected to the agglutination test in the fall to determine their status concerning pullorum disease.

In summation it may be stated that pullorum disease in turkeys is an insignificant problem providing the stock (eggs and poults) is not exposed to sources of infection. Eggs should not be incubated at custom hatcheries which select eggs from stock (chickens or other fowl) that is not officially recognized as being free from pullorum disease. In case valuable breeding lines are infected with the disease the infection may be eliminated through intensive testing of the young mature birds. A low diagnostic dilution appears most effective in detecting the infected individuals.

### Comments and Suggestions

During the past 17 years of pullorum-disease testing, marked progress has been made in the establishment and maintenance of pullorum-clean flocks. However, if one considers that only about one-sixth of the Massachusetts poultry population was tested during the 1936-37 season, it appears that further progress can be made in establishing additional pullorum-clean flocks. It seems appropriate to mention a few salient factors that may greatly expedite the eradication program for Massachusetts.

The practice of partial flock testing has been discussed elsewhere in this bulletin. In official testing this practice does not receive recognition even in flocks that have had a previous non-reacting test. Partial flock testing does not determine the true status of the entire flock. While the tested portion of the flock may not reveal reactors, one is unable to state that no infection exists in the untested portion. With part of the flock to be regarded as an unknown quantity as far as pullorum infection is concerned, such a flock should be considered unsafe for breeding since it may contain infection and lead to serious trouble. This fact has been experienced in routine testing.

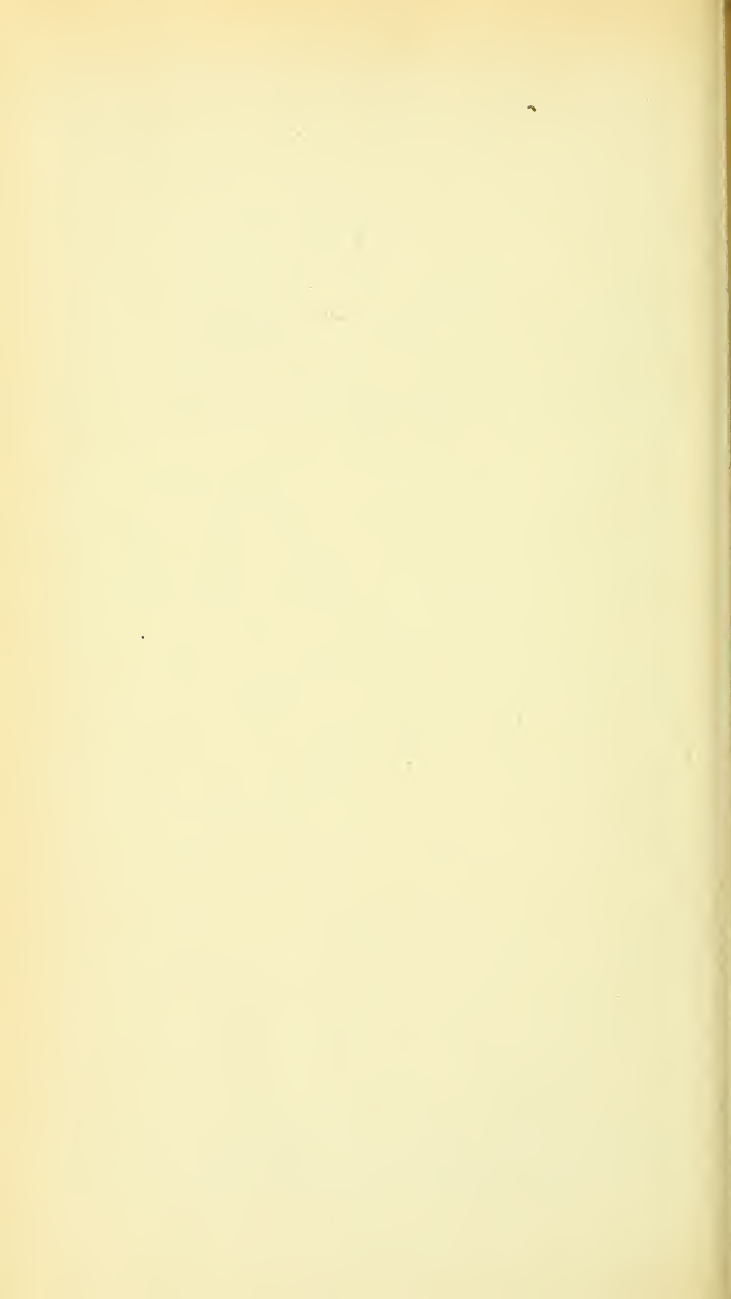
Since a number of poultrymen enter birds in contests and shows, it seems important to mention the dangers associated with returning such birds to the premises. On several occasions pullorum-disease "breaks" in pullorum-free flocks have been due to infected birds being returned from contests. The introduction of infection through this channel may be readily prevented by one of two plans: either not returning the birds to the flock, which is also preferable from the standpoint of other diseases; or holding the birds in rigid quarantine and subjecting them to the agglutination test immediately upon their return, and again within 30 days after the first test. The contest birds are usually returned in early fall, and since testing facilities are available at that time, this does not excuse one from not applying the test. The flock owner should look upon these measures as a safeguard to his flock.

In view of the fact that the testing work has increased considerably during the 1936-37 season, and the outlook may indicate possible further increases, the poultrymen are asked to cooperate with the laboratory in every way possible so that the policy of rendering high-quality service may be carried out. During the past two years the bulk of the testing work has been conducted during November and December. If flock owners are in a position to have their flocks tested during October or earlier, this will greatly relieve the congestion during November and December. Furthermore, weather conditions are more favorable for the collection of samples during the early fall months, which makes possible a more satisfactory and economical service.

Flock owners who know definitely that pullorum infection exists in their flocks should consider carefully the possible advantage of having their flocks tested. If such an owner is not in a position to eliminate the infection through

retesting, it would be inadvisable to expend funds for testing. It would be expedient not to test, but to introduce new stock from an officially recognized pullorum-clean source during the approaching hatching season. It is suggested that the problem of eradicating the disease from the premises be discussed with the laboratory or your local County Agent before testing work is undertaken.

The Massachusetts Department of Agriculture, State House, Boston, Mass., has established two official grades of pullorum-tested flocks. Owners of flocks that can meet the requirements of these grades can apply for official recognition by communicating with the Department of Agriculture. During the latter part and at the close of the testing season the Department of Agriculture publishes lists of names of flock owners whose flocks have qualified for the different grades. These official lists are sent upon request both within and without the State. One of the purposes of these official lists is to aid the buying public in identifying flocks that are free from pullorum infection. Official testing agencies in different states resort to these lists in approving importations of stock from Massachusetts. Owners of tested flocks are advised to communicate with the Massachusetts Department of Agriculture concerning official grades for pullorum-tested flocks.



MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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Control Series

Bulletin No. 89

November, 1937

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Inspection of Commercial  
Feedstuffs

By Philip H. Smith

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This is the forty-third report of feeding stuffs inspection and presents the results of analysis of 1,791 samples of feeding stuffs intended for livestock and poultry consumption, collected during the year ending September 1, 1937.

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MASSACHUSETTS STATE COLLEGE  
AMHERST, MASS.



# INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith<sup>1</sup>

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During the past year 1,124 brands of feed have been registered for sale by 216 manufacturers and dealers; 1,791 samples of feeding stuffs have been collected and subjected to analysis; 158 dealers, located in 96 towns, have been visited by the feed inspector at least once.

It is to be doubted if a clear understanding of the relation of Feedstuff Control to the purchaser of commercial feeds always exists. The statute sets up definite requirements in relation to a guarantee which must be attached to every lot or parcel of feed offered for sale. The principal duty of the feed control official is to prove whether or not the guarantee conforms to the content of the sack to which it is attached. Past experience has shown that at least 95 percent of the feeding stuffs offered for sale in the Massachusetts markets conform to guarantee. Deficiencies in the remaining 5 percent are in most instances so slight as not to warrant prosecution. About all that Control Service can do is to present in tabulated form the results of inspection and in cases of flagrant violation to prosecute the violators. The fact that a feeding stuff carries and conforms to its guarantee does not prove that it is suitable for the use of every feeder. A careful perusal of the guarantee should be the initial step in the purchase of a feed. The law does not prevent the use of any material having food value, no matter how slight, so long as it is not actually injurious to the animal or fowl fed. From the list of guaranteed ingredients note carefully the presence of screenings or other low grade milling offals; also if material is present which supposedly carries essential vitamins and mineral ingredients. There have been on the market certain feeds made of high grade oil cakes brought down to a 20 percent protein level by low grade milling offal which in certain instances have sold for as much as \$10 a ton less than the average of better feeds of the same protein level — a doubtful bargain. These feeds conform to the feeding stuffs act in every way, even to stating the ingredients used. This information is there for the use of the purchaser. Why not use it?

The requirements of feeding stuffs acts have not kept pace with scientific progress in the practice of feeding. Guarantees do, however, require the presentation of basic information of value to the purchaser in forming an intelligent opinion of the value of a commercial feed for his particular needs.

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<sup>1</sup>The following staff members assisted in the inspection: Albert F. Spelman and John W. Kuzmeski chemists; Frederick A. McLaughlin, microscopist; James T. Howard, inspector; Cora B. Grover, clerk.

## Complete Average Analyses of Feeds Collected (Percent)

## I. UNMIXED BY-PRODUCTS

## (a) Protein Feeds

Number of Samples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
				Found	Guaranteed	Found	Guaranteed		Found	Guaranteed	
	<b>Cottonseed Meal</b>										
3	Empire 41 % Protein	E. T. Allen Co.	8.1	42.1	41.0	5.7	5.5	28.6	9.6	13.0	5.9
3	Atlas 36 % Protein	E. T. Allen Co.	9.6	37.1	36.0	5.5	5.0	29.0	13.1	16.0	5.7
8	Cow-Eta Brand 41 % Protein	Ashcraft-Wilkinson Co.	7.8	41.3	41.0	6.1	5.0	28.7	10.3	13.0	5.8
3	Cow-Eta Brand 36 % Protein	Ashcraft-Wilkinson Co.	7.6	36.0	36.0	5.4	4.5	32.2	13.2	16.0	5.6
1	Miss Cairo 41 % Protein <sup>1</sup>	Cairo Meal & Cake Co.	7.2	41.7	41.0	7.0	6.0	28.9	8.8	10.0	6.4
1	Eastern States 41 % Protein <sup>1</sup>	Eastern States Farmers' Exchange	7.1	41.3	41.0	5.6	5.5	30.4	9.8	12.0	5.8
2	Gold Dust Brand 41 % Protein	Georgia Distributing Co.	8.7	41.1	41.0	5.5	6.0	28.6	10.2	10.0	5.9
10	Dixie Brand 41 % Protein	Humphreys-Godwin Co.	8.3	41.2	41.0	6.8	5.0	28.3	9.4	12.0	6.0
12	High Grade <sup>1</sup>	International Vegetable Oil Co., Inc.	8.2	40.5	41.0	5.7	6.0	28.6	11.1	10.0	5.9
1	Larro 41 % Protein	Larowe Milling Co.	9.3	41.3	41.0	6.0	6.0	29.3	8.1	10.0	6.0
4	"Lovit Brand," 41 % Protein	L. B. Lovitt & Co.	8.7	41.1	41.0	5.6	5.0	28.4	10.4	13.0	5.8
2	41 % Protein	Ralston Purina Co.	9.5	40.1	41.0	5.9	5.0	29.3	8.6	12.0	6.6
1	SCO-CO Brand 41 % Protein	Southern Cotton Oil Co.	7.8	41.5	41.0	6.0	5.0	28.4	10.5	13.0	5.8
	<b>Linseed Meal</b>										
1	34 % Protein Old Process	Archer-Daniels-Midland Co.	9.8	33.7	34.0	5.1	4.5	38.9	6.6	9.0	5.9
3	32 % Protein Old Process	Archer-Daniels-Midland Co.	9.3	34.9	32.0	4.8	4.5	38.1	7.2	9.0	5.7
1	"Maple Leaf" 38 % Protein	Canada Linseed Oil Mills, Ltd.	10.5	39.7	38.0	6.1	5.0	32.7	6.1	9.0	4.9
2	K & M Brand 34 % Protein	Kelloggs & Miller, Inc.	10.9	35.7	34.0	5.3	5.0	35.6	7.0	10.0	5.5
3	K & M Brand 32 % Protein	Kelloggs & Miller, Inc.	9.9	36.0	32.0	5.9	5.0	35.2	7.1	10.0	5.8
3	S W C Old Process 34 % Protein	Sherwin-Williams Co.	10.5	34.0	34.0	5.0	4.5	37.3	7.4	9.0	5.9
2	S W C Old Process 32 % Protein <sup>1</sup>	Sherwin-Williams Co.	9.1	36.9	32.0	5.0	4.5	34.9	7.5	9.0	5.7
4	Screwpress Linseed Oil Cake Meal	Sherwin-Williams Co.	6.0	35.3	35.0	8.6	6.5	36.8	6.9	8.0	6.4

11936 registration.

## Complete Average Analyses of Feeds Collected (Percent) — Continued

## I. UNMIXED BY-PRODUCTS — Continued

## (a) Protein Feeds — Continued

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
Soybean Oil Meal											
2	41 % Protein	Allied Mills, Inc.	9.8	41.0	41.0	5.8	5.0	32.0	5.6	7.0	5.8
3	Super Soy <sup>2</sup>	Allied Mills, Inc.	9.0	37.5	37.0	4.9	4.5	32.6	4.8	6.5	11.2
1	44 % New Process	Archer-Daniels-Midland Co.	10.5	43.9	44.0	0.9	0.5	34.1	5.0	7.0	5.6
2	Central	Central Soya Co., Inc.	9.3	42.2	41.0	5.4	4.5	32.4	5.3	7.0	5.4
2	Kellogg's 41 % Protein Old Process	Spencer Kellogg & Sons, Inc.	8.4	41.8	41.0	5.6	4.5	33.1	5.5	7.0	5.6
2	Expeller Process	Norris Grain Co.	12.3	42.5	41.0	5.9	4.5	29.0	5.0	7.0	5.3
1	41 % Protein	Ralston Purina Co.	10.5	42.1	41.0	6.1	4.5	30.4	5.3	7.0	5.6
8	Staley's	A. E. Staley Manufacturing Co.	8.5	43.7	41.0	5.3	4.5	31.7	5.2	7.0	5.6
Gluten Meal											
1	Amazo	American Maize-Products Co.	11.7	48.6	43.0	1.3	1.0	36.0	1.1	4.0	1.3
7	Diamond	Corn Products Refining Co.	11.3	43.7	43.0	3.0	1.0	38.6	2.2	4.0	1.2
2	Douglas	Penick & Ford Ltd., Inc.	10.1	42.8	43.0	2.5	1.0	38.3	3.5	4.0	2.8
3	Union	Union Starch & Refining Co.	7.9	46.4	43.0	1.8	1.0	41.7	1.0	3.0	1.2
Gluten Feed											
6	Cream of Corn	American Maize-Products Co.	11.6	26.9	25.0	2.8	2.0	46.0	6.2	8.5	6.5
2	Amazo Sweetened	American Maize-Products Co.	11.9	25.3	20.0	2.6	1.0	47.5	5.9	7.0	6.8
3	Clinton	Clinton Co.	12.8	26.7	25.0	3.0	2.0	44.2	6.0	8.5	7.3
5	Buffalo	Corn Products Refining Co.	11.4	26.4	25.0	2.3	2.0	45.9	7.1	8.5	6.9
4	Buffalo (Sweetened)	Corn Products Refining Co.	14.5	21.6	20.0	1.7	1.0	48.6	6.2	7.0	7.4
2	Douglas	Penick & Ford Ltd., Inc.	10.9	25.7	25.0	1.9	1.5	48.5	7.5	8.5	5.5
5	Staley's	A. E. Staley Manufacturing Co.	10.9	30.0	25.0	2.8	1.0	43.2	6.2	8.0	6.9
4	Union	Union Starch & Refining Co.	12.2	27.4	25.0	2.1	1.0	46.0	6.2	8.0	6.1
Distillers' Grains											
1	Corn Distillers' Dried Grains	Allied Mills, Inc.	7.2	29.0	28.0	8.1	8.0	42.4	11.5	15.0	1.8
2	Continental	Continental Distilling Corp.	8.2	27.2	28.0	8.6	7.0	41.9	12.4	15.0	1.7
4	Corn Distillers Dried Grains <sup>1</sup>	Continental Distilling Corp.	8.5	28.7	28.0	8.0	9.0	40.2	13.0	15.0	1.6
2	F <sup>1</sup>	Ferneau Grain Co.	6.0	28.9	28.0	8.4	9.0	42.4	10.8	14.0	3.5
7	Neumond	Neumond Co.	8.2	30.4	28.0	9.3	7.0	39.0	10.4	15.0	2.7



## Complete Average Analyses of Feeds Collected (Percent) — Continued

## I. UNMIXED BY-PRODUCTS — Continued

## (a) Protein Feeds — Continued

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
Wheat Mixed Feed											
2	Barco Mixed Feed <sup>1</sup>	G. N. Bartemus Co.	11.8	17.4	14.0	4.1	3.0	57.8	5.0	7.0	3.9
1	*Prize Mixed Feed	C. W. Brister & Son	11.4	15.1	14.0	3.9	3.5	59.0	6.3	9.0	4.3
2	Cowsey Heavy Mix Feed <sup>3</sup>	Nicolas Cowsey Grain Co.	11.7	16.0	16.0	4.7	4.5	54.1	6.7	7.0	6.0
2	Coweco Heavy Mixed Feed <sup>1</sup>	E. A. Cowee Co.	12.3	16.6	15.0	4.4	4.0	55.2	6.9	8.0	4.6
2	Pure Camel Fancy Wheat Feed	Excelsior Milling Co.	12.2	15.3	16.0	4.1	4.0	56.4	6.9	7.5	5.1
3	*Washburn's Gold Medal Fancy Wheat Mixed Feed	General Mills, Inc.	12.3	17.2	15.0	4.4	3.5	57.6	4.5	7.5	4.0
1	Merrimack Heavy Wheat Feed	Merrimack Farmers' Exchange, Inc.	12.6	17.9	15.0	4.4	4.0	54.5	6.2	9.0	4.4
3	*Moon's Fresh Ground Mixed Feed	Geo. Q. Moon & Co., Inc.	13.2	17.2	15.0	3.8	4.0	56.8	5.4	10.0	3.6
1	Planet Feed	Northwestern Consolidated Milling Div.	11.3	19.4	15.0	5.1	4.0	55.2	4.7	8.0	4.3
2	Park & Pollard Heavy Wheat Mixed Feed	Park & Pollard Co.	12.4	17.7	15.5	4.7	3.35	54.5	6.3	8.0	4.4
1	*Pillsbury's Fancy Wheat Mixed Feed	Pillsbury Flour Mills Co.	12.9	17.4	15.0	4.5	4.0	54.4	6.3	8.5	4.5
7	Occident Mixed Feed	Russell-Miller Milling Co.	12.4	18.9	15.0	5.0	4.5	52.1	6.9	9.5	4.7
7	*Wirthmore Wheat Feed	St. Albans Grain Co.	12.9	16.3	15.0	4.2	3.75	56.3	6.1	8.0	4.2
1	Litchfield Mixed Feed <sup>1</sup>	F. W. Stock & Sons	11.4	15.3	15.5	4.3	4.0	57.9	6.6	8.0	4.5
4	*Stratton's Wheat Mixed Feed <sup>1</sup>	Stratton & Co.	12.4	14.5	13.5	4.3	4.11	57.3	6.8	7.13	4.7
Wheat Bran											
2	*Atkinson Wheat Bran <sup>1</sup>	Atkinson Milling Co.	11.9	13.7	14.0	3.8	4.0	55.6	9.4	12.0	5.6
2	"C & C" Wheat Bran	Coatsworth and Cooper	13.4	15.5	15.0	5.1	3.5	50.6	9.8	11.5	5.6
2	*Sunfed Wheat Bran	Commander-Larabee Milling Co.	13.0	16.2	14.0	4.5	4.0	51.5	8.9	12.0	5.9
2	Copeland's "Dandy Bran"	Copeland Flour Mills, Ltd.	14.4	16.7	15.0	5.0	3.5	49.4	9.4	11.5	5.1
2	Bronco Bran <sup>1</sup>	J. A. Forrest Co.	14.5	16.8	15.0	5.1	3.5	49.2	9.0	11.5	5.4
1	*Wheat Bran <sup>1</sup>	Bartlett Frazier Co.	12.4	16.4	14.5	4.2	3.5	51.4	8.8	11.0	6.8
3	*Washburn's Gold Medal Hard Wheat Bran	General Mills, Inc.	13.3	16.3	14.0	4.9	4.0	50.6	9.2	12.0	5.7
4	"Hamco" Brand Wheat Bran	Frank B. Ham & Co., Ltd.	12.8	15.1	15.0	4.7	3.5	52.1	9.6	11.5	5.7
1	Big Flake Pure Wheat Bran	Kansas Flour Mills Corp.	15.1	16.7	15.0	4.1	3.5	50.1	7.8	11.0	6.2
1	Lakewoods Wheat Bran	Lake of the Woods Milling Co., Ltd.	15.5	17.0	15.0	5.0	3.5	48.2	8.9	11.5	5.4
4	*Rex Wheat Bran	Maple Leaf Milling Co., Ltd.	13.6	15.5	15.0	4.8	3.5	51.1	9.6	12.0	5.4
1	*Montco Wheat Bran	Montana Flour Mills Co.	14.6	17.7	15.0	4.5	3.0	49.2	8.4	12.0	5.6
5	*Moon's Wheat Bran	Geo. Q. Moon & Co., Inc.	13.3	17.1	15.0	4.2	3.0	54.8	6.2	10.0	4.4

2	Niagara Choice Wheat Bran <sup>1</sup>	Niagara Falls Milling Co.	13.9	16.6	14.5	4.5	4.0	51.0	8.5	11.0	5.5
3	Wheat Bran	Northwestern Consolidated Milling Div.	14.4	17.2	14.0	4.9	4.0	49.0	8.6	12.0	5.9
1	Parrheim Pure Wheat Bran <sup>1</sup>	Parrish & Heimbecker, Ltd.	14.1	16.6	15.0	5.0	3.5	49.3	9.4	11.5	5.6
2	*Pillsbury's Hard Wheat Bran	Pillsbury Flour Mills Co.	13.0	16.9	14.0	4.9	4.0	51.2	8.7	12.0	5.3
1	*Bell Cow Wheat Bran	Quaker Oats Co.	11.2	18.2	15.0	4.4	3.5	52.0	9.1	10.0	5.1
1	Occident Bran	Russell-Miller Milling Co.	14.3	20.4	14.0	4.9	4.0	47.1	7.9	11.5	5.4
1	Premier Wheat Bran	St. Lawrence Flour Mills Co., Ltd.	14.7	17.8	15.0	5.1	3.5	48.0	9.0	11.5	5.4
1	*Stock's Bran <sup>1</sup>	F. W. Stock & Sons	13.8	18.2	17.5	4.9	4.0	49.9	7.7	10.0	5.5
4	*Stratton's Bran	Stratton & Co.	12.1	14.1	14.0	4.2	4.0	57.6	7.0	11.0	5.0
1	*Wheat Bran	Texas Star Flour Mills	14.4	17.3	15.0	4.1	4.0	49.9	8.2	10.5	6.1

## (b) Starchy Feeds

Hominy Feed											
4	Burt's	General Foods Corp.	10.4	11.5	10.0	6.5	6.0	63.9	4.7	6.0	3.0
1	Hominy Feed <sup>1</sup>	Illinois Cereal Mills, Inc.	11.1	10.9	11.0	8.8	6.0	61.9	4.5	5.0	2.8
1	White	Kellogg Co.	11.4	10.7	10.0	7.3	6.0	65.0	3.3	5.0	2.3
2	O-Corno-O <sup>1</sup>	Kellogg Company of Canada, Ltd.	10.6	9.7	10.0	8.0	7.0	66.1	3.3	4.0	2.3
3	Badger White	Chas. A. Krause Milling Co.	12.0	11.6	10.0	6.1	6.0	63.5	4.2	5.0	2.6
3	M & H Choice Steam Cooked	Miner-Hillard Milling Co.	11.9	11.2	10.0	5.7	5.0	64.5	3.8	5.0	2.9
3	Hominy Feed	Patent Cereals Co.	11.5	10.9	10.0	7.4	5.0	63.6	3.7	5.0	2.9
2	Pratt's White <sup>1</sup>	Pratt Food Co., Inc.	12.9	10.9	10.0	5.6	5.0	64.3	3.9	6.0	2.4
2	White	Quaker Oats Co.	10.1	10.7	10.0	5.6	5.0	67.4	4.2	5.0	2.0
1	Yellow	Quaker Oats Co.	8.4	11.6	10.0	7.8	5.0	65.0	4.2	5.0	3.0
1	Paragon <sup>1</sup>	St. Albans Grain Co.	10.5	10.6	10.0	7.0	6.0	66.1	3.8	7.0	2.0
8	Dried Beet Pulp	Larowe Milling Co.	11.3	9.3	7.0	0.6	0.3	56.7	18.9	22.5	3.2
Rye Feed											
1	Rye Feed <sup>1</sup>	Upper Hudson Rye Flour Mills, Inc.	11.1	15.8	13.5	2.9	3.0	63.2	3.7	6.0	3.3
Oat Feed											
1	Eastern States Oat Feed and Molasses	Eastern States Farmers' Exchange	8.2	6.4	5.0	1.6	1.25	54.6	23.3	27.5	5.9
4	Vim Oat Mill Feed	Quaker Oats Co.	6.0	5.3	5.0	1.9	1.5	51.2	29.2	30.0	6.4
1	Sugared Vim Oat Mill Feed	Quaker Oats Co.	13.7	5.8	5.0	1.7	1.25	49.5	23.4	27.5	5.9

\*With screenings

11936 registration

\*Contains calcite flour.

## Complete Average Analyses of Feeds Collected (Percent) — Continued

## II. PREPARED FEEDS

## (a) Protein Feeds

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
	<b>Dairy and Molasses Feeds (more than 15 percent protein)</b>										
4	Empire 24 % Dairy Ration <sup>1</sup>	Allied Mills, Inc.	11.3	24.7	24.0	4.7	3.0	41.9	10.3	12.0	7.1
1	Wayne-Amco 24 % Dairy Ration	Allied Mills, Inc.	10.1	27.2	24.0	5.0	4.0	42.3	8.0	9.0	7.4
5	Empire 20 % Dairy Ration <sup>1</sup>	Allied Mills, Inc.	12.1	21.4	20.0	4.0	3.0	44.3	9.9	12.0	8.3
8	Wayne-Amco 20 % Dairy Ration	Allied Mills, Inc.	11.1	22.5	20.0	4.5	4.0	47.1	8.1	9.0	6.7
1	Empire 16.5 % Dairy Ration <sup>1</sup>	Allied Mills, Inc.	12.2	17.5	16.5	4.5	3.0	50.8	8.7	12.0	6.3
2	Wayne-Amco 16 % Dairy Ration	Allied Mills, Inc.	12.1	17.0	16.0	4.6	3.5	53.1	6.4	9.0	6.8
2	Ames 20 % Milk Maker	A. P. Ames Co.	11.1	21.3	20.0	3.7	4.0	46.0	8.9	10.0	9.0
3	Arctady 24 % Open Formula Production Ration										
4	Arctady 20 % Open Formula Production Ration	Arctady Farms Milling Co.	12.1	22.6	24.0	3.6	3.0	44.6	6.9	9.0	10.2
4	Peerless Milk Ration <sup>1</sup>	Arctady Farms Milling Co.	11.9	19.9	20.0	3.5	3.0	47.8	7.5	9.0	9.4
3	Arctady Sweet 16 Dairy Feed <sup>1</sup>	Arctady Farms Milling Co.	11.5	20.4	20.0	3.4	3.0	43.9	9.5	12.0	11.3
2	Big Ben Brand 20 % Dairy Feed	Arctady Farms Milling Co.	12.5	17.1	16.0	3.3	3.5	46.5	10.6	12.5	10.5
1	Beacon Dairy Ration	Barber & Bennett, Inc.	11.6	22.9	20.0	4.1	3.5	47.3	6.2	10.0	7.0
2	Beacon Sweet "24"	Beacon Milling Co., Inc.	11.3	23.9	24.0	5.0	4.5	45.0	7.8	9.0	6.7
1	Auburn Dairy Feed	Beacon Milling Co., Inc.	11.8	25.3	24.0	4.7	4.0	42.8	7.9	9.0	7.5
2	Beacon Sweet "20"	Beacon Milling Co., Inc.	11.3	20.8	20.0	4.4	4.0	49.1	7.9	10.0	6.8
1	Berkshire Hills Sweet Dairy Feed	Beacon Milling Co., Inc.	11.6	20.5	20.0	4.3	4.0	49.7	7.1	9.0	6.5
2	Borden's Dairy Feed	Berkshire Coal & Grain Co.	12.6	20.1	20.0	4.5	4.5	49.0	7.9	8.0	5.9
2	Brown's Dairy Ration	Borden Grain Co.	10.7	22.1	22.0	5.1	4.5	49.5	6.6	9.0	7.5
2	Community 20 Dairy Ration	Geo. B. Brown Corp.	11.8	21.1	20.0	4.2	4.0	48.0	9.7	12.0	7.3
2	Hilltop 20 Dairy Ration	Community Feed Stores, Inc.	11.3	21.3	20.0	5.3	4.5	47.9	7.3	9.0	6.6
3	Coweco's Dairy Feed <sup>1</sup>	Community Feed Stores, Inc.	12.0	23.5	22.0	4.8	4.0	45.0	10.6	12.0	7.0
1	Coweco 1925 Ration <sup>1</sup>	Nicolas Courcy Grain Co.	12.0	22.4	22.0	4.6	4.5	49.1	6.1	8.0	5.8
1	Dairy-Aide 24 % Ration <sup>1</sup>	E. A. Cowee Co.	11.1	25.3	24.0	4.4	4.5	45.7	7.8	10.0	6.6
1	Coweco 20 % Ration <sup>1</sup>	E. A. Cowee Co.	11.6	21.4	20.0	4.3	4.0	45.2	7.3	11.0	6.8
1	Dairy-Aide 20 % Ration <sup>1</sup>	E. A. Cowee Co.	11.0	22.3	20.0	3.7	4.0	48.8	7.3	10.0	7.2
1	Coweco Sunrise 20 % Dairy Ration <sup>1</sup>	E. A. Cowee Co.	10.2	22.0	20.0	4.1	4.0	46.1	9.0	11.0	7.5
2	Crystal 24 % Dairy Ration	Curley Brothers	11.5	24.6	24.0	4.2	3.5	47.8	9.4	10.0	6.4
						4.6	5.0	44.9	6.4	9.0	8.0



2	Crystal 20% Dairy Ration.	Curley Brothers	11.9	22.6	20.0	4.5	4.0	45.3	7.2	12.0	8.5
1	Delaware Sweet 24% Dairy Feed	Delaware Mills, Inc.	11.8	23.3	24.0	4.0	4.5	48.3	6.1	9.0	6.5
1	Delco 20% Dairy Feed <sup>1</sup>	Delaware Mills, Inc.	10.4	20.0	20.0	4.0	4.0	47.4	9.3	11.0	8.9
6	Indian Sweet 20% Dairy Feed	Delaware Mills, Inc.	12.1	21.8	20.0	4.3	4.5	47.3	6.9	10.0	7.6
4	Diauto's Dairy Feed	Frank Diauto	12.2	22.4	20.0	3.8	4.0	45.5	8.9	12.0	7.2
1	Diauto's Dairy Feed	F. Diehl & Son, Inc.	12.5	18.4	17.0	4.0	3.9	52.8	7.0	7.7	5.3
1	Frederick Dairy Feed	Dietrich & Gambrell, Inc.	10.3	19.2	18.0	4.2	3.0	47.7	11.0	14.0	7.6
3	D. & G. Dairy Feed	Dietrich & Gambrell, Inc.	13.0	23.6	24.0	4.4	4.0	39.5	11.4	12.0	8.1
1	Special Dairy Feed	East Bridgewater Farmers' Exchange	12.5	20.4	20.0	3.9	4.0	44.6	10.7	12.0	7.9
1	Eastern 20% Dairy Ration Sweetened	Eastern Grain Co.	12.7	22.0	20.0	4.9	4.0	48.1	7.5	9.0	4.8
2	Eastern 20% Dairy Ration Sweetened	Eastern Grain Co.	12.4	23.2	24.0	4.1	4.0	47.2	6.6	9.0	6.5
5	Eastern States 32% Supplement Feed	Eastern States Farmers' Exchange	12.9	22.0	20.0	4.2	4.0	48.0	7.1	9.0	5.8
5	Eastern States Milkmore Dairy Ration 24%	Eastern States Farmers' Exchange	10.7	33.1	32.0	5.1	4.5	37.7	6.5	8.0	6.2
4	Eastern States Fulpal Dairy Ration 20%	Eastern States Farmers' Exchange	11.8	25.6	24.0	4.8	4.5	44.5	7.1	9.0	6.2
7	Eastern States Highland 20 Dairy Ration	Eastern States Farmers' Exchange	11.7	21.1	20.0	4.7	4.5	50.2	6.7	8.5	5.6
4	Eastern States Highland 16 Dairy Ration	Eastern States Farmers' Exchange	10.9	20.9	20.0	4.4	4.0	47.4	10.0	11.5	6.4
1	Eastern States Sixteen Dairy Ration	Eastern States Farmers' Exchange	11.1	16.5	16.0	4.3	4.0	52.5	9.8	11.0	5.8
4	The Ellis Dairy Feed	Michael W. Ellis	12.7	17.0	16.0	4.3	4.0	54.6	6.1	8.0	5.3
2	The Ellis Special Dairy Feed	Michael W. Ellis	11.6	24.3	22.0	5.1	4.0	46.6	6.8	9.0	5.0
1	Elmore Milk Grains	Elmore Milling Co., Inc.	11.1	19.7	18.0	4.1	4.0	54.2	4.7	10.0	6.2
2	Granger 24% Dairy Ration	Elmore Milling Co., Inc.	10.5	24.9	24.0	4.8	4.5	46.1	8.1	10.0	5.6
1	Elmore Milk Grains Junior	Elmore Milling Co., Inc.	10.9	25.0	24.0	5.3	4.0	43.3	9.0	10.0	5.5
2	Elmore Milk Grains Junior Sweet	Elmore Milling Co., Inc.	12.1	23.3	20.0	4.4	4.5	47.4	7.0	10.0	5.8
3	Emco Feed	Elmore Milling Co., Inc.	11.7	23.0	20.0	5.2	4.5	47.3	7.0	10.0	5.8
1	Granger 20% Dairy Ration	Elmore Milling Co., Inc.	12.0	21.8	20.0	4.3	4.5	48.3	7.6	10.0	6.0
7	Waldorf 20% Dairy Ration	Elmore Milling Co., Inc.	12.3	21.0	20.0	4.2	4.0	47.1	8.5	11.0	6.9
3	Elmore's Sweet Digesto Dairy Feed	Elmore Milling Co., Inc.	11.8	21.1	20.0	4.4	4.0	44.9	10.3	11.0	7.5
2	Eshelman Challenge Dairy Feed	John W. Eshelman & Sons	11.8	16.4	16.0	3.6	4.0	51.0	10.6	12.0	6.6
2	Eshelman Red Rose 24 Dairy Feed	John W. Eshelman & Sons	10.9	24.7	24.0	4.3	4.0	43.7	8.1	11.0	8.3
3	Eshelman Conestoga 20 Dairy Feed	John W. Eshelman & Sons	11.5	25.7	24.0	4.4	4.0	43.1	7.9	11.0	7.4
3	Eshelman Certified 20% Dairy Ration	John W. Eshelman & Sons	11.0	22.2	20.0	4.9	4.0	43.7	9.1	11.0	9.1
2	Eshelman Lancaster 20 Dairy Feed	John W. Eshelman & Sons	11.0	21.4	20.0	4.4	4.0	49.7	6.5	8.0	7.0
3	Eshelman Fennys 16 Dairy Feed	John W. Eshelman & Sons	12.1	22.5	20.0	4.5	4.0	46.1	7.7	11.0	7.1
2	Diamond A Dairy Ration	Farm Service Stores, Inc.	11.6	17.9	16.0	4.0	3.0	46.9	10.2	11.0	9.4
2	North Star 24% Dairy Feed	Farm Service Stores, Inc.	10.4	23.6	24.0	4.8	5.0	45.8	9.6	8.0	6.2
3	C Dairy Ration	Farm Service Stores, Inc.	10.0	24.1	24.0	4.6	4.0	45.0	9.1	11.0	6.8
2	Diamond C Dairy Feed	Farm Service Stores, Inc.	11.8	22.4	21.0	4.4	4.5	47.1	7.8	9.0	6.5
1	Lawrence Cow Ration	Farm Service Stores, Inc.	10.9	21.7	21.0	4.6	4.5	47.4	8.6	10.0	6.8
1	New England Dairy Ration	Farm Service Stores, Inc.	13.7	17.5	20.0	3.9	4.0	49.7	8.1	12.0	6.8
2	North Star 20% Dairy Ration	Farm Service Stores, Inc.	11.4	20.1	20.0	3.4	3.0	46.8	10.4	11.5	6.3
3	18% Dairy Ration	Farm Service Stores, Inc.	12.3	19.1	20.0	4.4	4.5	47.8	9.4	12.0	7.0
2	Flory's Dairy Feed	Flory Milling Co., Inc.	11.4	19.1	18.0	4.0	3.5	46.2	12.5	13.0	6.8
3	Flory's 24% Special Dairy Feed	Flory Milling Co., Inc.	9.8	27.0	24.0	4.4	4.5	43.6	8.1	11.0	7.1
			10.7	25.8	24.0	4.4	3.5	42.9	8.8	10.0	7.4

<sup>1</sup>1936 registration.



## Complete Average Analyses of Feeds Collected (Percent) — Continued

## II. PREPARED FEEDS — Continued

## (a) Protein Feeds — Continued

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract		Fiber		Ash
				Found	Guar- anteed	Found	Guar- anteed			Found	Guar- anteed	
	<b>Dairy and Molasses Feeds (more than 15 percent protein) — Continued</b>											
4	Flory's 20% Special Dairy Feed	Flory Milling Co., Inc.	11.1	21.9	20.0	4.0	3.5	45.4		9.9	11.0	7.7
2	Record Dairy Feed	Flory Milling Co., Inc.	11.2	23.8	20.0	3.8	4.5	45.3		8.2	9.0	7.7
4	Garland 24% Dairy Ration	J. B. Garland & Son	12.9	24.6	24.0	4.2	4.0	43.8		7.5	10.0	7.0
4	Royal 24% Dairy Ration	J. B. Garland & Son	11.6	25.6	24.0	4.6	4.0	41.9		9.7	11.0	6.6
2	Garland 20% Dairy Ration	J. B. Garland & Son	12.8	22.0	20.0	4.1	4.0	46.8		7.6	10.0	6.7
4	Royal 20% Dairy Ration	J. B. Garland & Son	12.2	21.9	20.0	4.4	4.0	45.5		9.6	11.0	6.4
3	Grandin's 24% Dairy Feed (Sweetened)	D. H. Grandin Milling Co.	12.6	25.4	24.0	4.7	4.0	42.8		6.6	10.0	7.9
5	Grandin's Twin Six Dairy Feed	D. H. Grandin Milling Co.	11.7	22.9	22.0	4.8	4.5	46.8		6.9	10.0	6.9
2	Grandin's Milk Maker	D. H. Grandin Milling Co.	10.9	22.1	20.0	5.0	4.5	47.5		7.5	10.0	7.0
3	M-S (Money Saver) 20% Dairy Feed (Sweetened)	D. H. Grandin Milling Co.	11.1	21.8	20.0	3.7	3.5	44.8		10.1	12.0	8.5
3	Grandin's 20% Dairy Feed (Sweetened)	D. H. Grandin Milling Co.	12.7	21.2	20.0	4.2	4.0	48.1		6.3	10.0	7.5
1	Grandin's 16% Dairy Feed (Sweetened)	D. H. Grandin Milling Co.	12.8	20.2	16.0	4.3	4.0	49.4		6.7	10.0	6.6
1	Milky Way Dairy Feed 20%	Great Atlantic & Pacific Tea Co.	12.3	26.3	20.0	3.9	3.5	44.0		8.0	9.0	5.5
2	Daily Milk Dairy Feed <sup>1</sup>	Great Atlantic & Pacific Tea Co.	11.8	20.2	16.0	3.8	3.5	46.1		9.9	12.0	8.2
1	Phoenix 20 Dairy Ration <sup>1</sup>	Great Eastern Feed Mills	10.6	22.4	20.0	4.4	4.5	46.2		10.0	9.0	6.4
1	Special Red Horn 20 Dairy Feed	Hales & Hunter Co.	11.1	22.5	20.0	3.9	3.5	44.9		10.2	12.0	7.4
1	Welcome Dairy Feed	D. Harbeck	11.2	25.0	20.0	4.7	4.0	46.9		6.5	10.0	5.7
1	Hodgkins' Dairy Ration	D. B. Hodgkins' Sons	11.9	21.8	20.0	4.3	4.5	47.5		7.7	10.0	6.8
1	Hodgkins' Milk Ration	D. B. Hodgkins' Sons	11.9	22.2	19.0	4.1	3.5	46.0		9.1	13.0	6.7
2	Wantmore Sweetened Special Dairy 24%	Horvitz Grain Co.	10.9	24.6	24.0	4.3	4.0	40.6		12.1	13.0	7.5
2	Wantmore Dairy Ration	Horvitz Grain Co.	11.5	23.4	20.0	5.2	4.0	45.3		8.1	10.0	6.5
2	Wantmore Dairy Ration with Beet Pulp	Horvitz Grain Co.	11.0	21.7	20.0	5.2	4.0	47.2		8.5	10.0	6.4
2	Wantmore Sweetened Special Dairy 20%	Horvitz Grain Co.	11.3	21.4	20.0	4.1	4.0	45.7		10.7	13.0	6.8
2	Beatsall Milk Grains	Jacuth & Co.	11.8	20.5	20.0	4.1	4.0	48.8		7.5	8.0	7.3
4	Kasco Mills, Inc.	Kasco Mills, Inc.	12.4	24.9	22.0	4.3	4.0	44.4		7.1	10.0	6.9
2	Kasco Open Formula 20% Dairy Ration	Kasco Mills, Inc.	13.2	21.6	20.0	4.3	3.5	45.9		7.6	10.0	7.4
1	Kasco Sweet 16% Dairy Feed	Kasco Mills, Inc.	11.7	18.5	16.0	3.0	3.5	46.1		12.0	12.0	8.7
10	Larro Feed	Larrowe Milling Co.	11.2	21.2	20.0	3.9	3.75	48.4		9.2	12.0	6.1



## Complete Average Analyses of Feeds Collected (Percent) — Continued

## II. PREPARED FEEDS — Continued

## (a) Protein Feeds — Continued

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
	<b>Dairy and Molasses Feeds (more than 15 percent protein) — Concluded</b>										
4	Quaker 20% Protein Dairy Ration	Quaker Oats Co.	10.1	20.5	20.0	3.5	3.0	47.6	10.5	12.0	7.8
2	Quaker 16% Protein Dairy Ration	Quaker Oats Co.	10.5	16.8	16.0	3.2	3.0	49.4	12.0	13.5	8.1
1	Protena 24% Dairy Feed	Ralston Purina Co.	12.4	24.1	24.0	3.9	3.5	41.5	8.4	12.0	9.7
9	Purina Milking Cow Chow (24%)	Ralston Purina Co.	11.3	25.4	24.0	4.6	4.0	41.8	9.7	12.0	7.2
2	Protena 20% Dairy Feed	Ralston Purina Co.	11.7	21.5	20.0	4.5	3.5	42.9	10.8	12.0	8.6
7	Purina Milking Cow Chow (20%)	Ralston Purina Co.	11.6	22.1	20.0	4.4	4.0	46.6	8.5	12.0	6.8
1	Protena 16% Dairy Feed	Ralston Purina Co.	11.3	16.3	16.0	3.5	3.5	47.2	12.8	14.0	8.9
3	Purina Milking Cow Chow (16%)	Ralston Purina Co.	12.7	17.5	16.0	3.7	3.5	51.2	8.1	12.0	6.8
1	Riley's 20% Dairy Ration	D. F. Riley	11.1	20.7	20.0	4.9	4.5	49.1	7.5	9.0	6.7
2	Blue Tag Dairy Ration	Ryther & Warren	10.7	22.0	20.0	4.8	4.5	47.6	8.5	10.0	6.4
1	Minot Special Dairy Ration	Ryther & Warren	9.8	20.6	20.0	5.9	4.5	50.3	7.6	10.0	5.8
1	Wirthmore 25 Balanced Ration	St. Albans Grain Co.	13.2	25.3	25.0	4.6	4.5	44.2	7.2	8.5	5.5
1	Hygrade 24 Milk Ration	St. Albans Grain Co.	11.7	24.8	24.0	4.2	3.5	43.5	7.1	9.0	8.7
2	Hygrade 20 Milk Ration	St. Albans Grain Co.	12.7	21.2	20.0	4.5	3.5	49.6	6.6	8.5	5.4
4	Utility 20 Dairy Ration	St. Albans Grain Co.	11.6	20.3	20.0	3.9	3.5	48.0	9.7	12.0	6.5
4	Wirthmore 20 Dairy Ration	St. Albans Grain Co.	12.1	20.2	20.0	4.9	4.5	51.5	6.2	8.0	5.1
1	Wirthmore Dairy Feed with Beet Pulp	St. Albans Grain Co.	14.7	21.3	20.0	4.2	4.0	47.3	7.0	11.0	5.5
1	Utility 16 Dairy Ration	St. Albans Grain Co.	12.0	15.9	16.0	3.5	3.0	51.2	10.6	13.0	6.8
2	Wirthmore 16 Dairy Ration	St. Albans Grain Co.	12.1	17.6	16.0	4.5	4.0	52.4	5.6	8.0	7.8
2	The Ideal Dairy Ration	C. H. Symmes & Co.	13.6	20.6	20.0	4.9	3.5	48.0	6.1	8.5	6.8
1	Syracold Dairy Feed, Sweetened <sup>1</sup>	Syracuse Milling Co.	11.7	23.1	20.0	4.4	4.5	46.1	8.3	12.0	6.4
1	E-Gee 20% Dairy Feed	Toga Mills, Inc.	12.4	21.3	20.0	5.0	3.5	47.4	7.6	10.0	6.3
3	United Farmers Milk Pep	United Cooperative Farmers, Inc.	11.1	25.6	24.0	5.2	4.5	44.5	7.3	8.0	6.3
2	United Farmers Milkmaker	United Cooperative Farmers, Inc.	11.7	22.4	20.0	5.0	4.0	47.2	6.7	8.0	7.0
1	Paycheck 24% Dairy Ration	Unity Feeds, Inc.	12.5	24.7	24.0	4.4	4.0	42.8	9.4	11.0	6.2
1	Paymaster 24% Dairy Ration <sup>1</sup>	Unity Feeds, Inc.	13.1	24.4	24.0	3.9	4.0	43.8	7.6	9.0	7.1
1	Paymaster 20% Dairy Ration <sup>1</sup>	Unity Feeds, Inc.	13.5	22.2	20.0	3.7	4.0	45.8	7.5	9.0	7.3
2	Paycheck 20% Dairy Ration	Unity Feeds, Inc.	12.4	22.2	20.0	4.2	4.0	44.4	11.2	11.0	6.0
1	Ventura's Dairy Feed <sup>1</sup>	Arthur Ventura	11.2	18.3	20.0	4.2	4.5	54.7	6.3	8.0	5.3
1	"Made Right" Balanced Ration	C. P. Washburn Co.	10.8	23.3	22.0	4.9	5.0	45.4	7.9	10.0	7.7



## Complete Average Analyses of Feeds Collected (Percent) — Continued

## II. PREPARED FEEDS — Continued

## (b) Starchy Feeds

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash	
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed		
Fitting Rations												
2	Wayne Amco 12% Fitting Ration	Allied Mills, Inc.	11.9	13.9	12.0	4.3	3.0	56.1	7.1	9.0	6.7	
1	Arcady Fitting Ration <sup>1</sup>	Arcady Farms Milling Co.	13.0	11.8	12.0	3.1	3.5	51.8	7.9	7.0	12.4	
2	Beacon Fitting Ration	Beacon Milling Co., Inc.	12.0	15.8	15.0	5.3	4.0	53.6	6.3	8.0	7.0	
6	Eastern States Fitting Ration	Eastern States Farmers' Exchange	12.2	13.9	12.0	4.7	3.5	57.4	6.2	8.0	5.6	
2	Elmore Fitting Ration	Elmore Milling Co., Inc.	13.7	18.4	12.0	3.9	4.0	51.9	6.6	9.0	5.5	
1	Eshelman Red Rose Fitting Ration	John W. Eshelman & Sons	12.4	14.9	12.0	4.9	3.5	55.0	5.5	7.0	7.3	
1	Grandin's 14% Fitting Ration	D. H. Grandin Milling Co.	13.8	15.4	14.0	4.1	3.5	53.3	7.3	9.0	6.1	
1	Grandin's Fitting and Pasture Ration <sup>1</sup>	D. H. Grandin Milling Co.	12.7	15.2	14.0	4.4	4.0	54.5	6.3	8.0	6.9	
3	Kasco Fitting Ration	Kasco Mills, Inc.	13.3	16.3	14.0	4.2	4.0	53.2	6.2	8.0	6.8	
1	Merrimack Fitting Ration	Merrimack Farmers' Exchange, Inc.	12.1	14.3	14.0	4.5	4.5	56.4	6.6	8.0	6.1	
1	Pilgrim Fitting Ration	Ogden Grain Co.	12.7	14.0	12.0	4.0	4.0	58.8	5.0	7.0	5.5	
2	Park & Pollard Manamar Fitting Ration	Park & Pollard Co.	14.6	13.1	12.0	3.6	3.5	54.6	6.4	7.0	7.7	
2	Purina Heller Growing Chow	Ralston Purina Co.	14.1	16.5	14.0	3.4	2.5	49.7	8.5	14.0	7.8	
6	Purina Dry & Freshing Cow Chow	Ralston Purina Co.	14.1	14.4	12.5	3.0	2.5	49.8	10.4	14.0	8.3	
1	Wirthmore 14 Fitting Ration	St. Albans Grain Co.	13.1	14.8	14.0	4.8	4.0	57.1	5.8	7.0	4.4	
2	Blue Seal Fitting Ration	H. K. Webster Co.	13.4	15.1	13.0	4.5	4.5	53.6	6.5	7.0	6.9	
Stock Feeds												
1	Pennant Stock Feed	F. W. Bailey & Co.	10.6	9.3	9.5	4.8	4.0	60.0	9.0	9.5	6.3	
1	Courcy's Stock Feed <sup>1</sup>	Nicolas Courcy Grain Co.	8.8	13.4	10.0	4.2	3.0	56.6	11.3	10.0	5.7	
4	Coweco Stock Feed <sup>1</sup>	E. A. Cowee Co.	9.5	9.7	9.0	4.5	4.0	59.7	11.3	11.0	5.3	
1	Crystal Stock Feed	Curley Brothers	11.5	12.3	12.0	4.4	4.0	53.7	11.7	12.0	6.4	
2	Premier Stock Feed	Curley Brothers	12.0	9.7	9.0	5.0	4.5	58.7	8.9	13.5	5.7	
2	Delaware Stock Feed	Delaware Mills, Inc.	10.2	11.0	9.0	3.2	3.0	59.4	11.3	12.0	4.9	
5	Elmore Stock Feed	Elmore Milling Co., Inc.	10.8	11.3	10.0	5.4	3.0	58.6	9.9	12.0	4.0	
2	Eshelman Red Rose Stock Feed	John W. Eshelman & Sons	11.2	12.5	9.0	3.6	3.0	58.6	9.7	11.0	4.4	
2	North Star Stock Feed	Farm Service Stores, Inc.	10.8	10.1	9.0	4.0	3.0	59.6	11.2	12.0	4.3	
2	Garland's Stock Feed	J. B. Garland & Son	9.9	10.5	8.5	5.7	4.0	58.8	9.8	12.0	5.3	
2	Grandin's Stock Food <sup>1</sup>	D. H. Grandin Milling Co.	11.6	9.9	8.5	4.6	4.0	60.5	9.0	12.0	4.4	
1	Grandin's Stock Food	D. H. Grandin Milling Co.	9.8	11.0	9.0	5.2	4.0	57.4	10.1	12.0	6.5	
1	B B Hi-Test Stock Feed Sweetened	Maritime Milling Co., Inc.	12.3	9.5	9.0	2.7	3.0	63.4	7.1	12.0	5.0	





## Complete Average Analyses of Feeds Collected (Percent) — Continued

## II. PREPARED FEEDS — Concluded

## (b) Starchy Feeds — Concluded

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
Molasses and Horse Feeds — Concluded											
3	Moon's 90 Molasses Horse Feed	Geo. Q. Moon & Co., Inc.	13.3	11.5	9.0	4.1	3.0	62.7	5.3	10.0	3.1
2	New England Quality Horse Feed	New England Grain Dealers Coop. Assn.	13.8	10.3	8.0	3.5	2.0	61.1	7.5	10.0	3.8
3	Pilgrim Horse Feed	Ogden Grain Co.	13.7	11.3	10.0	3.4	4.0	62.9	5.4	9.0	3.3
1	Bulky-Sweet Dairy Feed	Park & Pollard Co.	13.2	12.5	11.0	2.6	3.0	53.1	9.9	12.0	8.7
6	Yankee Horse Feed	Park & Pollard Co.	13.6	11.7	10.0	4.0	3.5	59.2	7.4	9.0	4.1
1	Quaker Green Cross Horse Feed	Quaker Oats Co.	11.5	11.3	10.0	2.9	2.5	58.9	10.1	12.0	5.3
2	Quaker Thorobred Horse Feed	Quaker Oats Co.	12.7	11.5	10.0	3.9	3.5	62.1	5.8	8.0	4.0
2	Purina Omolene	Ralston Purina Co.	12.5	11.8	10.0	3.9	3.2	60.1	7.6	9.0	4.1
2	Purina Bulky Omolene	Ralston Purina Co.	13.3	13.2	10.0	3.9	3.2	58.0	7.0	11.0	4.6
4	Purina Bulky Las Chow	Ralston Purina Co.	14.6	11.5	9.0	2.3	1.3	52.3	10.6	15.0	8.7
1	Protina Sweet Feed "D"	Ralston Purina Co.	12.6	12.6	6.0	2.1	1.0	43.8	18.9	25.0	10.0
2	Wirthmore Fodder Greens	St. Albans Grain Co.	14.0	11.7	10.0	2.9	3.0	57.2	8.5	15.0	5.7
2	Wirthmore Horse Feed	St. Albans Grain Co.	12.4	10.3	9.8	3.4	3.25	65.3	5.0	9.0	3.6
1	Hygrade Horse Feed	St. Albans Grain Co.	12.3	11.6	9.5	4.0	3.25	62.4	5.0	9.0	4.7
2	United Farmers Horse Feed	United Cooperative Farmers, Inc.	13.4	12.2	10.5	3.8	3.5	61.9	5.1	6.5	3.6
1	Unity Horse Feed	Unity Feeds, Inc.	13.6	11.8	10.0	4.1	3.0	60.5	6.0	9.0	4.0
2	Blue Seal Horse Feed	H. K. Webster Co.	13.4	10.7	10.5	3.2	3.5	63.7	5.2	7.5	3.8
1	Pure Feed Horse Ration	West-Nesbitt, Inc.	12.8	11.9	9.0	3.1	3.0	57.5	11.2	10.0	3.5
Miscellaneous Feeds											
2	Palm Kernel Oil Cake Meal	Franklin Baker Co., Inc.	8.2	20.0	19.0	6.1	6.0	51.3	10.4	12.0	4.0
1	Babassu Meal	Franklin Baker Co., Inc.	5.9	26.1	—	6.0	—	46.0	10.5	—	5.5
1	Vitameltk Base	Dawes Products Co.	9.2	47.1	44.0	6.4	4.5	23.5	3.3	4.0	10.5
1	Ground Oats & Banner Feed	F. Diehl & Son, Inc.	10.3	13.2	6.0	4.6	2.0	53.8	13.4	30.0	4.7
1	Egg-O-Milk Blend	Egg-O-Milk Co.	9.0	30.2	32.0	1.3	2.0	50.5	2.6	4.0	6.4
1	Burt's Cereal Feed	General Foods Corp.	9.1	13.0	12.0	2.6	3.0	66.3	4.5	6.0	4.5
1	Gerard Milkmaid Blend	Gerard Milk Products Co.	10.1	31.1	32.0	2.1	1.5	50.2	—	4.0	6.5
1	Kelco Meal (Pure Domestic Kelp)	Kelco Co.	13.0	5.0	3.0	0.5	0.1	39.2	5.4	10.0	36.9
1	Alco Malt Sprouts	C. J. Martens Grain Co.	9.1	28.5	24.0	1.2	0.5	42.7	11.7	15.0	6.8
1	Pineapple Bran	M. W. Park & Co.	13.2	4.4	4.0	1.5	0.75	62.0	15.5	16.0	3.4
1	Banner Feed	Quaker Oats Co.	9.5	14.5	13.0	4.1	4.5	51.3	15.4	19.0	5.2

2	"Made Right" Mixed Feed	C. P. Washburn Co. . . . .	12.8	16.5	15.0	4.6	4.0	54.4	7.1	8.0	4.6
1	Peebles Lacto-G Dried Whey (Milk Sugar Feed) . . . . .	Western Condensing Co. . . . .	9.1	12.1	12.5	0.8	0.5	66.0*	-	0.1	12.0

## III. POULTRY FEEDS

3	Alfalfa Stem Meal	A. B. Caple Co. . . . .	12.3	11.9	9.0	1.3	0.8	35.6	32.9	40.0	6.0
	Alfalfa Meal										
2	Alfalfa Meal	A. B. Caple Co. . . . .	10.0	13.1	13.0	1.7	1.0	38.2	29.9	33.0	7.1
1	Green Acres Brand Alfalfa Meal	Green Acres Farms . . . . .	9.1	15.7	17.0	2.1	2.0	40.5	24.1	27.0	8.5
1	Meadow Brook Farms Superior Alfalfa Meal	Meadow Brook Farms . . . . .	4.6	21.9	17.0	3.0	2.0	40.5	21.8	27.0	8.2
2	Alfalfa Meal	Pecos Valley Alfalfa Mill Co. . . . .	11.8	16.1	13.0	1.8	1.5	34.4	26.8	33.0	9.1
	Alfalfa Leaf Meal										
1	Alfalfa Leaf Meal	A. B. Caple Co. . . . .	12.3	22.6	20.0	2.3	2.5	36.6	16.2	18.0	10.0
2	Fernando Alfalfa Leaf Meal — Ideal Greens	Fernando Valley Milling & Supply Co. . . . .	9.5	19.9	20.0	2.6	2.5	37.1	19.0	18.0	11.9
4	Peevee Alfalfa Leaf Meal	Pecos Valley Alfalfa Mill Co. . . . .	9.9	20.5	20.0	2.7	2.5	40.0	15.4	18.0	11.5
	Feeding Oatmeal										
3	Fine Ground Feeding Oatmeal	Farmers Service Bureau . . . . .	11.3	16.0	14.0	4.1	5.0	63.9	2.2	4.0	2.5
2	Bronco Fine Ground Feeding Oatmeal <sup>1</sup>	J. A. Forrest Co. . . . .	10.5	17.6	15.0	8.8	6.0	58.2	2.6	4.0	2.3
1	Fruen's Glenwood Fine Ground Feeding Oatmeal <sup>1</sup>	Fruen Milling Co. . . . .	11.8	15.0	15.0	3.7	5.0	64.9	2.4	3.75	2.2
1	Feeding Oatmeal	Ralston Purina Co. . . . .	7.4	16.0	15.0	6.6	5.0	66.4	1.6	3.7	2.0
	Chick Starting and Growing Feeds										
4	Wayne Chick Starter	Allied Mills, Inc. . . . .	10.9	20.3	17.0	5.7	4.0	49.6	5.6	6.0	7.9
3	Empire Growing Mash	Allied Mills, Inc. . . . .	11.7	18.4	16.0	5.0	3.0	51.8	6.2	7.0	6.9
1	Wayne Growing Mash	Allied Mills, Inc. . . . .	10.7	17.6	16.0	5.7	4.0	54.9	4.9	6.0	6.2
3	Wayne Growing Mash with Sardine Oil	Allied Mills, Inc. . . . .	11.2	17.0	16.0	5.3	4.0	54.8	5.1	6.0	6.6
1	Ames Complete Starter & Broiler Ration	A. P. Ames Co. . . . .	12.4	18.7	17.5	4.4	4.0	52.7	4.2	7.0	7.6
1	Arcady-Wonder Complete All Mash Chick Starter	Arcady Farms Milling Co. . . . .	12.6	19.2	17.0	4.9	4.0	51.3	5.9	6.0	6.1
3	Arcady Wonder Growing Mash	Arcady Farms Milling Co. . . . .	10.3	17.4	17.0	4.7	4.0	51.2	6.2	7.0	10.2
1	Sunkist Growing Mash <sup>1</sup>	Arcady Farms Milling Co. . . . .	9.0	17.7	16.0	4.8	4.0	50.2	8.6	8.0	9.7
2	Beacon Growing Mash	Beacon Milling Co., Inc. . . . .	10.5	20.0	18.0	6.2	4.0	48.0	6.2	7.0	9.1

\*I actose.

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## Complete Average Analyses of Feeds Collected (Percent) — Continued

## III. POULTRY FEEDS — Continued

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water		Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
			Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed				
									Chick Starting and Growing Feeds -- Continued			
5	Beacon Complete Starting Ration	Beacon Milling Co., Inc.	11.2	18.4	17.5	4.0	53.4	4.8	6.0	7.2		
1	Community Chick Mash	Community Feed Stores, Inc.	10.5	18.8	18.0	5.4	51.8	5.9	7.0	7.6		
1	Community Growing Mash	Community Feed Stores, Inc.	11.6	18.4	17.0	5.2	51.3	5.8	8.0	7.7		
2	C & P Growing Mash	Cover & Palm Co.	10.9	20.4	17.0	5.1	47.7	5.4	7.0	10.5		
2	C & P Starter & Broiler Ration	Cover & Palm Co.	11.0	19.8	17.0	4.8	49.4	5.2	6.0	9.8		
2	Coweco Growing Mash <sup>1</sup>	E. A. Cowee Co.	11.0	17.0	14.0	5.9	53.0	6.3	8.0	6.8		
2	Utility Growing Ration	Chas. M. Cox Co.	12.8	16.0	15.0	4.4	54.5	5.7	7.0	6.6		
1	Premier Growing Mash <sup>1</sup>	Curley Brothers	12.2	19.9	18.5	3.9	50.4	5.3	6.5	8.3		
1	Premier Starting Food <sup>1</sup>	Curley Brothers	10.9	19.6	18.5	3.8	53.6	3.8	5.0	8.3		
1	Crystal Growing Mash	Curley Brothers	11.2	18.3	16.0	4.9	50.0	4.6	5.0	8.0		
2	Crystal All Grain Starting Food <sup>1</sup>	Curley Brothers	11.8	17.0	15.0	5.0	56.3	3.8	4.0	6.1		
1	Crystal Complete Growing Feed	Curley Brothers	11.5	15.2	14.0	4.6	59.0	3.6	4.0	6.1		
1	Delaware All Mash Chick Starter	Delaware Mills, Inc.	11.1	16.9	17.0	5.6	49.5	4.7	6.0	12.2		
1	Delaware Growing Mash	Delaware Mills, Inc.	9.4	19.3	17.0	6.6	51.3	6.1	6.5	7.3		
1	Indian Growing Mash	Delaware Mills, Inc.	10.8	16.9	15.0	5.4	53.7	6.6	7.0	6.8		
1	Diauto's Fancy Chick Growing Mash	Frank Diauto	13.6	18.5	16.0	4.8	49.4	4.9	5.0	8.6		
1	Frederick Growing Mash	Dietrich & Gambrell, Inc.	10.2	19.1	16.0	5.0	51.2	6.0	8.0	8.5		
1	All Mash Starter & Grower	Dietrich & Gambrell, Inc.	12.0	16.4	14.0	5.0	57.7	3.4	4.0	5.5		
1	Special Growing Feed	East Bridgewater Farmers' Exchange	11.8	17.2	15.0	5.0	55.6	4.5	7.0	5.9		
6	Eastern States Developer	Eastern States Farmers' Exchange	10.6	19.7	18.5	5.6	40.0	4.5	6.5	8.3		
5	Eastern States Starting and Broiler Ration	Eastern States Farmers' Exchange	10.6	19.8	18.5	5.0	53.3	3.7	5.0	7.6		
4	Eastern States All-Mash Developer	Eastern States Farmers' Exchange	11.4	16.0	14.5	4.9	56.6	4.7	7.0	6.4		
3	Elmore Growing Mash	Elmore Milling Co., Inc.	10.9	18.6	17.0	6.2	50.5	5.7	8.0	8.1		
2	Elmore Chick saver	Elmore Milling Co., Inc.	11.0	18.9	16.5	6.6	49.7	5.4	9.0	8.4		
4	Elmore Complete Growing Ration	Elmore Milling Co., Inc.	11.9	17.4	15.0	5.0	52.4	6.0	8.0	7.3		
1	Eshelman Red Rose All Mash Starter	John W. Eshelman & Sons	9.3	16.9	16.0	4.4	59.0	3.7	6.5	6.7		
1	Eshelman Red Rose Growing Mash	John W. Eshelman & Sons	11.1	19.9	16.0	5.3	51.0	5.6	7.0	7.1		
2	C Growing Mash	Farm Service Stores, Inc.	9.8	18.8	18.0	4.8	52.1	6.1	7.0	8.4		
3	North Star Growing Mash	Farm Service Stores, Inc.	10.8	20.1	16.0	5.4	47.8	5.2	7.0	10.6		
3	Flory's "All-Mash" Chick Starter	Flory Milling Co., Inc.	11.7	19.5	17.0	5.4	51.0	4.8	6.0	7.6		

## INSPECTION OF COMMERCIAL FEEDSTUFFS

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Flory's Growing Mash	.	.	.	.	.	11.0	19.5	17.0	5.8	4.0	51.4	5.2	7.0	7.1
Garland Chick Starter	.	.	.	.	.	12.3	19.1	17.0	4.9	3.5	51.4	4.0	5.0	8.3
Garland Complete Starter and Broiler Mash	.	.	.	.	.									
Garland Growing Mash	.	.	.	.	.	12.1	19.4	17.0	5.3	3.5	49.8	4.7	5.5	8.7
Goode Starting & Growing Mash	.	.	.	.	.	11.8	17.6	14.0	6.1	3.0	50.9	5.9	7.0	7.7
Grandin's Combined Chick and Broiler Ration <sup>1</sup>	.	.	.	.	.	10.9	15.9	16.0	5.8	4.0	50.7	7.9	7.0	8.8
Grandin's Growing Mash	.	.	.	.	.	11.2	17.7	15.0	5.2	4.0	52.5	5.0	6.0	8.4
Grandin's Baby Chick Starter	.	.	.	.	.	10.7	16.1	15.0	5.0	4.0	50.8	6.6	8.0	10.8
Daily Growth Growing Mash	.	.	.	.	.	10.6	16.2	14.0	6.0	4.0	56.0	4.2	5.0	7.0
Daily Growth Chick Starter	.	.	.	.	.	11.5	17.4	17.5	5.5	4.0	49.4	6.2	6.5	8.0
Red Comb Chick Starter	.	.	.	.	.	11.4	19.4	16.0	6.1	4.0	53.2	3.9	5.0	8.0
Red Comb Growing Mash	.	.	.	.	.	11.6	19.9	18.0	4.8	4.0	52.0	5.1	6.0	6.6
Welcome Starter & Broiler Ration	.	.	.	.	.	11.3	17.6	16.0	5.1	4.0	54.0	5.9	7.0	6.1
Welcome Growing Mash	.	.	.	.	.	11.7	19.8	18.0	6.2	4.0	51.7	4.3	7.0	6.3
Hodgkins' Growing Mash	.	.	.	.	.	11.6	18.6	16.0	5.5	4.0	50.8	4.8	7.0	8.8
Jaquith & Co. Growing Mash	.	.	.	.	.	11.5	19.3	17.0	5.4	3.5	49.7	5.4	10.0	8.7
Jaquith & Co. Starting Feed	.	.	.	.	.	10.9	17.1	16.0	5.7	5.0	52.2	6.0	6.0	8.1
Just-Right Growing Mash <sup>1</sup>	.	.	.	.	.	11.3	16.8	14.0	5.6	5.0	50.9	3.7	4.0	11.7
Kasco All Mash Chick Food	.	.	.	.	.	11.4	17.6	16.0	4.3	4.0	53.5	5.7	6.0	7.5
Apex Growing Mash <sup>1</sup>	.	.	.	.	.	11.9	19.2	17.0	5.7	4.0	51.6	3.5	5.5	8.1
Apex Starter	.	.	.	.	.	10.7	17.7	16.0	4.9	4.0	52.5	5.1	8.5	9.1
Apex Complete Grower <sup>1</sup>	.	.	.	.	.	12.2	17.0	15.0	5.7	4.0	54.0	4.4	6.0	6.7
Larro Chick Builder	.	.	.	.	.	11.9	15.8	14.0	5.7	4.0	55.7	4.8	8.5	6.1
Mansfield Chick Growing Feed	.	.	.	.	.	11.0	21.5	19.0	5.1	4.0	48.0	5.5	7.0	8.9
B-B Complete Chick Starter Ration	.	.	.	.	.	11.7	20.9	17.0	5.2	4.0	47.2	6.3	8.0	8.7
B-B Daisy Growing Mash <sup>1</sup>	.	.	.	.	.	10.2	22.4	20.0	6.1	4.0	48.9	5.2	6.0	7.2
Merrimack Growing Mash	.	.	.	.	.	10.6	17.2	15.0	5.2	3.5	50.9	8.3	9.0	7.8
Merrimack Chick Starter	.	.	.	.	.	11.5	18.7	17.0	5.8	4.5	50.5	4.1	5.0	9.4
Farm Bureau Brand Developer Mash	.	.	.	.	.	11.3	19.1	16.0	5.5	4.0	54.0	3.4	4.0	6.7
Farm Bureau Brand Starter & Broiler	.	.	.	.	.	11.5	20.3	18.5	5.1	4.0	50.1	5.1	6.5	8.2
Farm Bureau All Mash Developer Pellets	.	.	.	.	.	11.5	19.3	18.5	5.2	4.0	52.2	4.5	5.0	7.3
New England Quality Growing Mash <sup>1</sup>	.	.	.	.	.	12.0	17.4	14.5	5.0	3.5	53.2	4.9	7.0	7.5
New England Quality Growing Mash <sup>1</sup>	.	.	.	.	.	10.8	19.9	16.0	5.2	4.5	49.9	6.8	7.0	7.4
Pilgrim Chick & Broiler Ration	.	.	.	.	.	11.6	19.2	18.0	4.3	4.0	53.9	4.6	6.0	6.4
Pilgrim Growing Mash	.	.	.	.	.	11.7	16.5	16.0	4.6	4.0	54.4	6.0	8.0	6.8
Park & Pollard Growing Feed	.	.	.	.	.	9.3	18.8	14.0	4.5	3.0	51.4	6.8	7.0	9.2
Egg-Em-On Growing Feed	.	.	.	.	.	11.1	20.0	18.0	5.0	4.0	51.1	5.1	7.0	7.7
Purina Chick Startena	.	.	.	.	.	12.3	20.6	18.0	5.7	4.0	51.0	4.1	7.0	6.3
Purina Growing Chow	.	.	.	.	.	11.9	19.0	17.0	5.0	3.5	51.5	5.3	7.0	7.3
Purina Chick Growena.	.	.	.	.	.	12.2	16.7	15.0	5.8	3.5	54.9	5.5	5.4	5.4
Riley's Chick & Broiler Ration	.	.	.	.	.	10.9	18.8	16.0	5.0	4.0	53.8	4.0	4.5	7.7
Minot Chick Mash <sup>1</sup>	.	.	.	.	.	11.0	18.9	18.0	5.4	4.0	52.3	3.6	6.0	8.8
Wirthmore Baby Chick Starter.	.	.	.	.	.	12.5	19.1	18.0	4.8	4.0	53.3	3.9	5.0	6.3

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## Complete Average Analyses of Feeds Collected (Percent) — Continued

## III. POULTRY FEEDS — Continued

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
	<b>Chick Starting and Growing Feeds — Concluded</b>										
2	Worthmore Complete Broiler Ration	St. Albans Grain Co.	11.8	20.1	17.5	5.1	4.0	49.8	4.6	5.5	8.6
3	Worthmore Complete Growing Ration	St. Albans Grain Co.	12.8	14.6	14.0	4.9	3.75	56.4	4.7	6.0	6.6
1	Tioga Starter and Grower <sup>1</sup>	Tioga Mills, Inc.	11.6	19.5	16.5	4.9	4.0	50.7	6.4	6.5	6.9
2	United Farmers Growing Mash	United Cooperative Farmers, Inc.	11.3	18.3	16.0	5.9	4.0	50.9	5.3	7.0	8.3
2	United Farmers Starting & Growing Mash	United Cooperative Farmers, Inc.	11.4	18.4	16.0	5.4	4.0	52.4	4.3	6.0	8.1
1	Unity Complete Starting & Broiler Mash	Unity Feeds, Inc.	12.0	18.6	17.0	4.7	3.5	51.2	5.2	5.0	8.3
1	Unity Growing Mash	Unity Feeds, Inc.	11.1	18.0	14.0	6.2	3.0	51.8	5.7	7.0	7.2
3	"Made Right" Starting & Growing Feed	C. P. Washburn Co.	11.1	19.8	20.0	4.6	5.0	50.1	5.7	5.0	8.7
2	Blue Seal Chick Starter	H. K. Webster Co.	9.9	20.9	18.0	5.1	4.0	52.1	5.1	6.0	6.9
2	Blue Seal Growing Mash	H. K. Webster Co.	11.0	20.7	18.0	5.7	4.0	48.9	5.8	6.5	7.9
1	Blue Seal Chick Builder	H. K. Webster Co.	12.5	20.5	18.0	5.6	4.0	45.8	5.4	6.5	10.2
1	Pure Feed Growing Mash <sup>1</sup>	West-Nesbitt, Inc.	10.6	18.8	18.0	5.3	4.5	48.9	5.4	5.5	11.0
1	Williams' Growing Feed	Est. M. G. Williams	12.4	18.5	15.0	4.7	4.0	51.4	4.6	7.0	8.4
2	Preferred Starting & Growing Feed	Stanley Wood Grain Co.	12.0	17.3	16.0	4.4	4.0	54.3	4.0	6.0	8.0
	<b>Laying Mash</b>										
2	Wayne Mash Concentrate	Allied Mills, Inc.	8.5	37.2	32.0	5.5	4.0	27.4	6.2	8.0	15.2
6	Wayne Egg and Breeder Mash	Allied Mills, Inc.	11.2	19.4	18.0	5.8	3.5	49.8	5.6	7.0	8.2
6	Empire Egg Mash	Allied Mills, Inc.	11.6	18.1	16.5	4.9	3.5	52.7	5.9	7.0	6.8
2	Ames Egg Mash	A. P. Ames Co.	11.0	21.5	20.0	5.2	4.0	46.0	5.4	7.0	10.9
2	Ames Complete Cycle Ration	A. P. Ames Co.	11.8	17.8	16.0	4.8	4.0	52.8	4.5	6.0	8.3
1	Arady Wonderlas for Poultry	Arady Farms Milling Co.	11.9	28.6	30.0	5.0	4.0	36.8	5.0	6.0	12.7
4	Sunkist Egg Mash <sup>1</sup>	Arady Farms Milling Co.	10.6	20.7	20.0	4.4	4.0	48.0	7.5	8.0	8.8
2	Arady Wonder Complete Laying Ration <sup>1</sup>	Arady Farms Milling Co.	11.0	18.6	16.0	4.6	4.5	51.3	6.3	7.0	8.2
2	Weaco Dry Mash	W. E. Atkinson Co.	11.9	19.0	18.0	4.7	4.0	49.9	5.2	7.0	9.3
1	Beacon Egg Mash	Beacon Milling Co., Inc.	9.0	22.8	22.0	5.2	4.5	46.0	5.9	7.0	9.1
1	Beacon's Cayuga Laying Mash	Beacon Milling Co., Inc.	10.4	21.3	20.0	6.1	4.0	48.0	6.3	7.0	9.9
1	Beacon CC Pellets	Beacon Milling Co., Inc.	13.2	19.5	18.0	3.9	1.0	56.0	2.7	5.0	4.7
1	Beacon Battery Laying Ration	Beacon Milling Co., Inc.	11.3	18.3	16.0	5.1	4.0	51.3	5.6	7.75	8.4



## Complete Average Analyses of Feeds Collected (Percent) — Continued

## III. POULTRY FEEDS — Continued

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water		Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
			Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
	Laying Mash — Continued											
2	Fountain's Buttermilk Laying Mash.	Fred A. Fountain	12.4	17.0	20.3	17.0	4.8	4.5	48.4	4.0	7.0	10.1
6	Garland Laying Mash	J. B. Garland & Son	11.8	18.0	20.5	18.0	6.1	3.0	47.0	5.3	7.0	9.3
5	Royal Laying Mash	J. B. Garland & Son	11.7	19.3	19.3	18.0	6.0	3.0	47.7	6.6	8.0	8.7
2	Eventually Gold Medal Egg Mash <sup>1</sup>	General Mills, Inc.	10.9	19.4	19.4	19.0	5.6	5.0	46.7	6.0	8.0	11.4
1	Neponset Poultry Mash	W. K. Gilmore & Sons, Inc.	10.7	21.6	21.6	20.0	5.2	3.0	44.3	5.1	10.0	13.1
4	Conference Mash	W. K. Gilmore & Sons, Inc.	10.9	18.0	18.0	17.0	4.7	4.0	48.3	6.0	6.5	12.1
2	Goode Laying Mash	Goode Grain Co.	10.9	16.6	16.6	17.0	5.5	4.0	52.1	8.0	7.0	6.9
6	Grandin's Laying Mash	D. H. Grandin Milling Co.	10.8	20.2	20.2	20.0	4.7	4.0	48.3	6.5	8.0	9.5
2	Grandin's Start-to-Finish Mash	D. H. Grandin Milling Co.	11.3	19.0	19.0	16.0	5.4	4.0	50.2	6.4	7.0	7.7
2	Grandin's Complete Laying Ration <sup>1</sup>	D. H. Grandin Milling Co.	12.3	18.6	18.6	15.0	5.1	4.0	48.3	6.4	7.0	9.3
1	Daily Egg Laying Mash Feed	Great Atlantic & Pacific Tea Co.	11.4	20.7	20.7	20.0	5.8	4.0	45.8	5.9	6.5	10.4
1	Morning Glory Egg Mash	Hales & Hunter Co.	10.3	21.3	21.3	20.0	5.0	4.0	48.6	6.5	8.0	8.3
3	Red Comb Egg Mash	Hales & Hunter Co.	10.7	19.7	19.7	18.0	5.0	4.0	49.6	5.8	7.0	9.2
1	Red Comb Batty Fed Layer	Hales & Hunter Co.	11.0	18.1	18.1	15.0	4.9	4.0	52.4	5.7	6.0	7.9
1	Red Comb All-Mash	Hales & Hunter Co.	10.4	18.5	18.5	15.0	4.5	4.0	52.0	7.0	8.0	7.6
2	Welcome Laying Mash	D. Harbeck	11.6	18.1	18.1	17.0	5.7	4.0	50.4	4.9	8.0	9.3
1	Hodgkins' Poultry Mash	D. B. Hodgkins' Sons.	11.1	20.9	20.9	18.0	5.8	5.0	47.6	5.8	8.0	8.8
2	MaK-M-Lay	Horvitz Grain Co.	11.6	20.7	20.7	20.0	5.2	5.0	47.3	6.1	9.0	9.1
2	Jaquith & Co. Laying Mash	Jaquith & Co.	10.5	19.1	19.1	17.0	5.5	4.0	47.6	6.8	8.0	10.5
1	Just-Right Egg Mash <sup>1</sup>	Jersee Co.	10.8	20.5	20.5	18.0	4.8	5.0	48.3	7.0	8.5	8.6
2	Apex Laying Mash	Kascoe Mills, Inc.	10.8	21.1	21.1	20.0	5.2	4.0	48.7	4.9	8.5	9.3
1	Kascoe Hatching Egg Mash <sup>1</sup>	Kascoe Mills, Inc.	11.7	22.1	22.1	20.0	5.1	4.0	47.0	5.7	6.5	9.4
2	Kascoe Laying Mash	Kascoe Mills, Inc.	10.4	20.6	20.6	20.0	5.2	4.0	48.0	5.9	6.5	8.9
2	"K" Laying Mash <sup>1</sup>	Kascoe Mills, Inc.	12.2	18.7	18.7	18.0	4.5	4.0	50.9	4.8	9.0	8.9
4	Kascoe Poultry Flushing Mash	Kascoe Mills, Inc.	10.2	18.7	18.7	17.0	4.7	4.0	52.5	4.1	5.5	9.8
5	Kascoe All Mash Laying Food	Kascoe Mills, Inc.	12.0	15.9	15.9	15.0	5.1	4.0	56.6	4.4	6.0	6.0
3	Larroe Egg Mash	Larroe Milling Co.	10.7	21.9	21.9	20.0	5.0	4.0	48.0	5.5	7.5	8.9
2	Manco Laying Mash	Mansfield Coal & Grain Co.	10.8	22.2	22.2	20.0	5.8	5.0	43.8	4.8	6.5	12.6
2	Mansfield Dry-Poultry Mash <sup>1</sup>	Mansfield Milling Co., Inc.	11.5	22.3	22.3	22.0	5.8	5.0	44.4	5.5	7.0	10.5
2	B-B Daisy Egg Mash	Maritime Milling Co., Inc.	10.3	21.2	21.2	20.0	5.5	3.5	45.1	7.9	9.0	10.0
1	B B Layer & Breeder Mash	Maritime Milling Co., Inc.	10.2	21.5	21.5	20.0	5.8	4.5	45.7	7.1	7.0	9.7

## INSPECTION OF COMMERCIAL FEEDSTUFFS

[illegible]

1936 registration.



## Complete Average Analyses of Feeds Collected (Percent) — Continued

## III. POULTRY FEEDS — Continued

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
<b>Laying Mash — Concluded</b>											
2	"Made Right" Complete Layer	C. P. Washburn Co.	11.4	18.1	16.0	4.9	4.5	53.4	4.7	5.0	7.5
2	Blue Seal Laying Mash	H. K. Webster Co.	11.8	21.5	20.0	5.5	3.5	47.7	5.0	6.0	3.5
2	Blue Seal Breeders' Mash	H. K. Webster Co.	10.4	20.8	19.0	5.4	4.0	48.6	4.8	6.0	10.0
2	Blue Seal Egg Mash	H. K. Webster Co.	1.3	19.7	19.0	5.6	4.5	49.1	5.3	6.0	8.0
2	Blue Seal College Mash	H. K. Webster Co.	10.8	19.8	17.0	6.5	4.5	48.6	5.7	6.0	8.6
2	Blue Seal Improved All Mash Ration	H. K. Webster Co.	12.3	16.8	15.0	5.2	4.5	56.1	3.4	4.0	6.2
1	Pure Feed Egg Mash <sup>1</sup>	West-Nesbitt, Inc.	11.2	20.6	18.0	5.2	5.0	48.8	4.6	7.0	9.6
2	Williams' Laying Mash	Est. M. G. Williams	11.8	16.8	16.0	4.8	4.0	51.9	5.1	7.0	9.6
2	Preferred Laying Mash <sup>1</sup>	Stanley Wood Grain Co.	12.1	18.6	17.0	5.0	4.5	48.7	5.2	7.0	10.4
<b>Fattening and Broiler Feeds</b>											
2	Wayne Broiler Ration	Allied Mills, Inc.	10.2	19.6	18.0	6.1	3.5	51.7	5.4	8.0	7.0
3	Wayne Poultry Fattener	Allied Mills, Inc.	11.2	15.2	13.5	4.9	3.5	60.1	5.4	8.0	3.2
1	Beacon Flething Pellets	Beacon Milling Co., Inc.	10.5	15.9	15.0	4.7	3.5	59.0	4.6	6.5	5.3
1	Diauto's Broiler Ration	Frank Diauto	11.9	18.5	19.0	4.9	5.25	50.5	5.5	3.5	8.7
1	Eastern States Fattener Mash	Eastern States Farmers' Exchange	11.4	15.9	14.5	4.9	4.0	60.8	4.3	5.0	2.7
2	Elmore Complete Broiler Ration <sup>1</sup>	Elmore Milling Co., Inc.	10.8	19.9	17.0	5.5	4.0	49.7	5.5	5.0	8.6
1	Elmore Flething Pellets	Elmore Milling Co., Inc.	12.5	14.8	15.0	5.6	5.0	60.0	4.0	6.0	3.1
2	Eshelman Red Rose Broiler Ration	John W. Eshelman & Sons	10.5	20.1	17.0	5.3	4.5	51.5	4.8	7.0	7.8
2	Red Comb Broiler Mash	Hales & Hunter Co.	11.1	19.8	18.0	5.1	4.0	51.7	5.1	7.0	7.2
1	Red Comb Crate Fattener <sup>1</sup>	Hales & Hunter Co.	11.5	15.3	13.0	4.6	4.0	60.0	5.4	6.0	3.2
1	Apex Broiler Ration	Kasco Mills, Inc.	12.4	18.7	17.0	4.7	4.0	52.1	4.5	8.0	7.6
1	Kasco Broiler Ration	Kasco Mills, Inc.	12.0	20.4	18.0	5.9	4.0	49.1	4.1	5.5	8.5
1	Kasco Poultry Fattener	Kasco Mills, Inc.	12.1	18.5	13.0	6.3	4.5	52.6	5.0	5.0	5.5
1	Larroe Broiler Feed	Larroe Milling Co.	11.2	19.2	18.0	4.4	4.0	50.7	4.4	6.5	10.1
3	Purina Broiler Chow	Purina	11.2	20.9	18.0	5.6	4.0	51.3	4.8	7.0	6.2
2	Purina Chicken Fatena <sup>1</sup> Checkers	Ralston Purina Co.	12.0	16.5	14.0	4.3	4.0	58.4	4.3	6.0	4.5
1	Purina Chicken Fatena	Ralston Purina Co.	10.9	17.4	14.0	5.5	4.0	57.3	5.4	7.5	3.5
2	Wirtkmore Flething Pellets	St. Albans Grain Co.	10.5	16.4	15.0	6.1	4.5	55.4	5.8	6.5	5.8
2	"Made Right" Complete Broiler Ration	C. P. Washburn Co.	11.6	18.8	18.0	4.5	4.5	52.0	5.6	5.0	7.5





Complete Average Analyses of Feeds Collected (Percent) — Continued  
III. POULTRY FEEDS — Concluded

Num- ber of Sam- ples	FEEDSTUFFS	NAME OF MANUFACTURER	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash	
				Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed		
Turkey Feeds—Concluded												
1	Larro Turkey Adult Mash	Larroe Milling Co.	10.6	21.2	20.0	5.0	4.0	48.8	6.0	7.5	8.4	
1	Park & Pollard Turkey Grower <sup>1</sup>	Park & Pollard Co.	12.2	20.0	20.0	4.5	4.0	51.1	5.0	6.0	7.2	
1	Purina Turkey Breeder Chow	Ralston Purina Co.	10.8	25.9	23.0	7.2	5.0	39.5	5.2	7.0	11.4	
5	Purina Turkey Growing & Fattening Chow <sup>1</sup>	Ralston Purina Co.	11.8	22.9	21.0	5.6	3.5	47.4	4.6	8.0	7.7	
2	Wirthmore Turkey Growing Ration	St. Albans Grain Co.	11.4	21.0	20.0	5.1	4.0	50.6	4.6	7.0	7.3	
1	Wirthmore Turkey Fattening Ration	St. Albans Grain Co.	12.0	16.8	16.0	4.4	4.5	55.8	4.8	7.0	6.2	
Rabbit Feeds												
1	Beacon Compress Rabbit Feed	Beacon Milling Co., Inc.	10.6	18.3	18.0	4.0	3.0	55.2	5.7	7.0	6.2	
1	Kasco Rabbit Pellets	Kasco Mills, Inc.	12.1	16.1	13.0	4.0	3.0	56.0	4.7	11.0	7.1	
1	Purina Rabbit Chow	Ralston Purina Co.	11.2	16.7	16.0	4.9	3.5	56.4	5.8	8.0	5.0	
4	Purina Rabbit Chow (Complete Ration) (Buffalo Mill)	Ralston Purina Co.	13.3	16.3	13.5	3.4	2.5	51.7	9.4	16.0	5.9	
1	Wirthmore Complete Rabbit Ration	St. Albans Grain Co.	12.9	13.9	14.0	2.7	3.0	53.7	10.4	12.0	6.4	

<sup>1</sup>1936 registration.

## Complete Average Analyses of Feeds Collected (Percent) — Continued

## IV. ANIMAL PRODUCTS

Number of Samples	FEEDSTUFFS	NAME OF MANUFACTURER	Protein		Fat		Phos- phoric Acid	Ash
			Found	Guar- anteed	Found	Guar- anteed		
Meat								
1	Corenco Meat and Bone Scrap 50 %	Consolidated Rendering Co.	52.3	50.0	12.9	6.0	9.5	26.6
1	Corenco 55 % Meat Scrap	Consolidated Rendering Co.	54.3	55.0	8.5	6.0	8.5	24.2
1	Corenco Meat Scrap 60 %	Consolidated Rendering Co.	63.1	60.0	8.7	6.0	7.4	20.0
1	Morse's 60 % Meat Scraps	Jas. F. Morse & Co.	61.5	60.0	9.9	8.0	7.6	21.4
2	55 % Register Brand Meat Scrap	John Reardon & Sons Co.	53.5	55.0	11.3	6.0	9.4	25.4
1	Steamed Meat & Bone	N. Roy & Son	57.6	50.0	10.7	8.0	8.2	18.9
Meat and Bone								
2	Corenco 45 % Meat & Bone Scrap	Consolidated Rendering Co.	49.8	45.0	10.4	6.0	11.2	31.8
4	Corenco 50 % Meat & Bone Scrap	Consolidated Rendering Co.	50.3	50.0	9.5	6.0	10.6	30.8
2	Morse's 45 % Meat Scraps	Jas. F. Morse & Co.	44.9	45.0	9.7	8.0	13.2	35.4
3	Morse's 50 % Meat Scrap	Jas. F. Morse & Co.	49.2	50.0	9.7	8.0	11.6	31.8
3	45 % Register Brand Meat & Bone Scrap	John Reardon & Sons Co.	46.5	45.0	10.7	6.0	12.4	34.1
4	50 % Register Brand Meat & Bone Scrap	John Reardon & Sons Co.	50.3	50.0	10.1	6.0	12.0	31.4
1	Steamed Meat & Bone	N. Roy & Son	48.8	50.0	10.7	8.0	11.5	28.8
1	Rubco 50 % Meat Bone Scrap	H. M. Rubin Co., Inc.	50.0	50.0	9.0	5.0	11.4	31.0
Bone Meal								
1	Digesta-Bone	Consolidated Chemical Industries Inc.	5.4	5.0	0.6	none	33.0	82.5
1	Corenco Bone Meal	Consolidated Rendering Co.	23.8	20.0	0.5	2.0	25.8	64.1
1	Rearco Bone Meal	John Reardon & Sons Co.	26.3	20.0	2.6	3.0	13.2	59.3
1	Rearco 72 Feeding Bone	John Reardon & Sons Co.	5.3	5.0	0.6	none	32.3	77.0
Fish								
1	Corenco Cod & Haddock Meal	Consolidated Rendering Co.	63.4	62.0	2.3	2.0	8.8	21.0
2	Phoenix Fish Meal <sup>1</sup>	Great Eastern Feed Mills	55.1	55.0	14.1	4.0	6.9	20.8
2	Maine Vitamin D Fish Meal	Maine Fish Meal Co.	56.1	55.0	16.8	12.0	5.1	16.5

<sup>1</sup>1936 registration.

Complete Average Analyses of Feeds Collected (Percent) — Concluded  
IV. ANIMAL PRODUCTS — Concluded

Number of Samples	FEEDSTUFFS	NAME OF MANUFACTURER	Protein		Fat		Phos- phoric Acid	Ash
			Found	Guar- anteed	Found	Guar- anteed		
	<b>Fish — Concluded</b>							
2	Fish Meal for Poultry	Jas. F. Morse & Co.	65.3	55.0	5.3	3.0	8.9	21.8
6	Register Brand Cod and Haddock Fish Meal	John Reardon & Sons Co.	65.1	60.0	4.0	3.0	8.6	21.2
2	Wilpaco Cod & Haddock Fish Meal	Wilmington Packing Co.	64.1	63.0	6.5	2.0	7.6	20.1
	<b>Milk Products</b>						Milk Sugar by Difference	
3	Dairyland Dried Skim Milk	Archer-Daniels-Midland Co.	37.1	32.0	1.6	0.5	47.8	9.0
2	Buell-Boston Dried Skim Milk	B. & B. Dairy Co., Inc.	36.7	33.0	1.0	0.2	50.2	8.1
3	Burek-Brand Powdered Skim Milk	C. W. Bueckhalter, Inc.	34.4	32.0	1.5	0.75	50.2	8.1
2	Dairyland Dried Skim Milk	Dairymen's League Co-operative Assn., Inc.	34.3	33.0	1.1	0.5	50.4	8.0
1	Old Sol Dried Skim Milk	General Commodity Corp.	37.3	32.0	0.9	0.5	48.1	7.8
3	Skim Milk Powder	Keystone Dairy Co.	35.8	32.0	1.2	0.75	49.7	8.2
2	Dried Skim Milk Powder	New England Dairies, Inc.	35.1	32.0	0.7	0.25	51.5	8.3
3	Dried Skim Milk	United Farmers Cooperative Creamery Assn., Inc.	33.9	32.0	0.8	0.5	49.9	7.7
3	Ward's Pure Dried Skim Milk	Ward Dry Milk Co.	34.9	32.0	1.3	1.0	49.5	7.9

11936 registration.

## Summary of Analyses

Season of 1936-1937

	Samples	Brands	Manu- facturers
<b>Alfalfa Products</b>			
Alfalfa Meal . . . . .	6	4	4
Alfalfa Leaf Meal . . . . .	7	3	3
Alfalfa Stem Meal . . . . .	3	1	1
<b>Animal and Fish Products</b>			
Bone Meal . . . . .	4	3	3
Fish Meal . . . . .	15	5	5
Meat Scrap . . . . .	7	6	4
Meat and Bone Scrap . . . . .	20	8	5
Milk Powder . . . . .	22	9	9
<b>Brewers and Distillers By-Products</b>			
Brewers Grains . . . . .	17	5	5
Distillers Grains . . . . .	18	7	6
<b>Cereal Meals</b>			
Barley Meal . . . . .	1	—	—
Corn Meal . . . . .	30	—	—
Ground Oats . . . . .	51	—	—
Feeding Oatmeal . . . . .	7	4	4
Provender (Corn and Oats) . . . . .	18	12	12
<b>Corn Products</b>			
Gluten Meal . . . . .	13	4	4
Gluten Feed . . . . .	31	8	6
Hominy Feed . . . . .	23	11	10
<b>Miscellaneous Mill Residues</b>			
Beet Pulp . . . . .	8	1	1
Oat Feed . . . . .	6	3	2
Rye Feed . . . . .	1	1	1
Unclassified . . . . .	15	13	12
<b>Oil Cake Meals</b>			
Soy Bean Meal . . . . .	21	8	7
Cottonseed Meal . . . . .	41	13	11
Linseed Meal . . . . .	18	8	5
<b>Wheat Products</b>			
Red Dog Flour . . . . .	11	9	9
Flour Middlings . . . . .	10	4	4
Standard Middlings . . . . .	15	13	13
Wheat Mixed Feed . . . . .	39	15	15
Wheat Bran . . . . .	51	22	22
<b>Mixtures for Animals</b>			
Calf Meals . . . . .	22	13	11
Dairy Feeds . . . . .	414	187	64
Fitting Rations . . . . .	34	16	16
Hog Feeds . . . . .	19	10	9
Molasses Feeds . . . . .	113	49	31
Rabbit Feeds . . . . .	8	5	4
Stock Feeds . . . . .	51	24	23
<b>Mixtures for Poultry</b>			
Chick Growing and Starting Feeds . . . . .	185	95	49
Chick Scratch Feeds . . . . .	10	9	9
Duck Feeds . . . . .	13	10	3
Broiler and Fattening Feeds . . . . .	30	19	12
Laying Mashies . . . . .	321	140	69
Turkey Feeds . . . . .	42	24	14
Totals . . . . .	1791	801	—

## Feeds Not Conforming to Guarantees

(Shortages of less than one percent in protein or fat or an excess of less than one percent in fiber are not listed)

Samples Collected	Samples Not Conforming to Guarantee	Manufacturer and Brand	Protein Deficiency Percent	Fat Deficiency Percent	Fiber Excess Percent
1	1	Arcady Farms Milling Co. Arcady Wonderlas for Poultry . . . . .	1.4	-	-
8	2	Ashcraft-Wilkinson Co. { Cow-Eta Brand 41% Protein Cottonseed Meal	1.1	-	-
3	1	{ Cow-Eta Brand 41% Protein Cottonseed Meal	2.1	-	-
		{ Cow-Eta Brand 36% Protein Cottonseed Meal	1.2	-	-
2	1	Atkinson Milling Co. Atkinson Wheat Bran . . . . .	1.3	-	-
2	1	Borden Grain Co. Borden's Dairy Feed . . . . .	1.4	-	-
6	1	Coatsworth and Cooper "C & C" Wheat Bran . . . . .	1.5	-	-
4	1	Consolidated Rendering Co. Corenco 50% Meat & Bone Scrap . . . . .	1.1	-	-
1	1	Corenco Bone Meal . . . . .	-	1.5	-
6	3	Continental Distilling Corp. { Continental Distillers Dried Grains . . . . .	1.6	-	-
		{ Continental Distillers Dried Grains . . . . .	-	1.5	-
		{ Continental Distillers Dried Grains . . . . .	-	1.1	-
1	1	Frank Diauto Diauto's Special Egg Mash . . . . .	1.7	-	-
1	1	Diauto's Broiler Ration . . . . .	-	-	2.0
1	1	Egg-O-Milk Co. Egg-O-Milk Blend . . . . .	1.8	-	-
7	1	Elmore Milling Co., Inc. Granger 20% Dairy Ration . . . . .	1.4	-	-
4	1	Elmore Egg Mash . . . . .	1.3	-	-
3	2	Farmers Service Bureau { Feeding Oatmeal . . . . .	-	1.1	-
		{ Feeding Oatmeal . . . . .	-	1.5	-
2	2	Farm Service Stores, Inc. { Diamond A Dairy Ration . . . . .	-	-	1.4
		{ Diamond A Dairy Ration . . . . .	-	-	1.7
1	1	Lawrence Cow Ration . . . . .	2.5	-	-
2	1	Fernando Valley Milling & Supply Co. Fernando Alfalfa Leaf Meal — Ideal Greens . . . . .	-	-	1.5
2	1	Ferneau Grain Co. F Corn Distillers Grains . . . . .	-	1.9	-
2	1	Flory Milling Co., Inc. Flory's 32% Protein Supplement Mash . . . . .	2.4	-	-
3	2	Goode Grain Co. { Goode Starting & Growing Mash . . . . .	-	-	1.3
		{ Goode Starting & Growing Mash . . . . .	2.5	-	3.0
2	1	Goode Laying Mash . . . . .	3.3	-	-
1	1	Green Acre Farms Green Acres Brand Alfalfa Meal . . . . .	1.3	-	-
1	1	Frank B. Ham & Co., Ltd. "Hamco" Brand Wheat Bran . . . . .	1.6	-	-

## Feeds Not Conforming to Guarantees — Concluded

(Shortages of less than one percent in protein or fat or an excess of less than one percent in fiber are not listed)

Samples Collected	Samples Not Conforming to Guarantee	Manufacturer and Brand	Protein Deficiency Percent	Fat Deficiency Percent	Fiber Excess Percent
1	1	<b>D. Harbeck</b> Welcome Turkey Starter . . . . .	2.2	-	-
10	1	<b>Humphreys-Godwin Co.</b> Dixie Brand 41% Protein Cottonseed Meal . . . . .	1.6	-	-
2	1	<b>International Vegetable Oil Co., Inc.</b> High Grade Cottonseed Meal . . . . .	1.5	-	-
2	1	<b>Kellogg Company of Canada, Ltd.</b> O-Corn-O Hominy Feed . . . . .	1.1	-	-
3	1	<b>Chas. A. Krause Milling Co.</b> Badger White Hominy Feed . . . . .	-	2.2	-
6	2	<b>Geo. O. Moon Co.</b> { U. S. 20% Dairy Ration . . . . . { U. S. 20% Dairy Ration . . . . .	1.9 1.7	- -	- -
3	1	<b>Jas. F. Morse &amp; Co.</b> Morse's 50% Meat Scraps . . . . .	3.3	-	-
4	1	<b>Neumond Co.</b> Neumond Dried Brewers Grains . . . . .	2.4	-	-
2	2	<b>Niagara Falls Milling Co.</b> { Choice Wheat Red Dog . . . . . { Choice Wheat Red Dog . . . . .	- -	1.5 1.2	- -
2	1	<b>Park &amp; Pollard Co.</b> Bidwell 24% Dairy Ration . . . . .	-	1.5	-
2	2	{ Bidwell 20% Dairy Ration . . . . . { Bidwell 20% Dairy Ration . . . . .	- -	- -	1.7 2.5
1	1	{ Bidwell 20% Dairy Ration . . . . . Doublex 16% Dairy Ration . . . . .	- -	- -	1.8 1.4
1	1	Manamar Top Notch Dairy Ration . . . . .	-	-	1.4
1	1	Top Notch 16% Dairy Ration . . . . .	-	-	1.4
2	1	<b>Penick &amp; Ford Ltd., Inc.</b> Douglas Gluten Meal . . . . .	1.8	-	-
1	1	<b>H. C. Puffer Co.</b> Sweetened Producer Dairy Feed . . . . .	1.1	-	1.7
2	1	<b>John Reardon &amp; Sons Co.</b> 55% Register Brand Meat Scrap . . . . .	2.2	-	-
1	1	<b>N. Roy &amp; Son</b> Steamed Meat & Bone . . . . .	1.2	-	-
1	1	<b>Arthur Ventura</b> Ventura's Dairy Feed . . . . .	1.7	-	-
3	3	<b>C. P. Washburn Co.</b> { "Made Right" 16% Dairy Feed . . . . . { "Made Right" 16% Dairy Feed . . . . . { "Made Right" 16% Dairy Feed . . . . .	- - -	- - -	1.9 1.4 1.8
2	2	<b>H. K. Webster Co.</b> { Blue Seal Stock Feed . . . . . { Blue Seal Stock Feed . . . . .	- -	- -	4.4 3.6
1	1	<b>West-Nesbitt, Inc.</b> Pure Feed Horse Ration . . . . .	-	-	1.2

## Certified Ingredients

Allied Mills, Inc.

### Empire Egg Mash

Dried buttermilk, dried skim milk, meat scraps, fish meal, soybean oil meal, choice alfalfa meal, wheat bran, wheat standard middlings, corn gluten feed, corn meal, fine ground oats, 1 % ground limestone and 1 % salt.

### Empire Growing Mash

Corn meal, wheat bran, soybean oil meal, fine ground oats, meat scraps, fish meal, wheat standard middlings, choice alfalfa meal, corn gluten feed, dried skim milk, dried buttermilk, 1 % salt and 1 % ground limestone.

### Wayne-Amco 24 % Dairy Ration

Cottonseed meal, corn gluten meal, corn distillers' dried grains, brewers' dried grains, corn gluten feed, old process linseed oil meal, soybean oil meal, peanut oil meal, ground oats, corn meal and hominy meal, wheat bran, cane molasses, 0.5 % steamed bone meal, 1.5 % ground limestone, 1.0 % salt, 0.03 % iron oxide, 0.0005 % potassium iodide.

### Wayne-Amco 20 % Dairy Ration

Cottonseed meal, brewers' dried grains, corn distillers' dried grains, ground oats, corn gluten feed, corn meal and hominy meal, soybean oil meal, corn gluten meal, old process linseed oil meal, wheat bran, cane molasses, 0.5 % steamed bone meal, 1.5 % ground limestone, 1.0 % salt, 0.03 % iron oxide and 0.0005 % potassium iodide.

### Wayne-Amco 16 % Dairy Ration

Corn distillers' dried grains, cottonseed meal, brewers' dried grains, corn gluten feed, old process linseed oil meal, corn meal, hominy meal, soybean oil meal, ground oats, wheat bran, cane molasses, 0.5 % steamed bone meal, 1.0 % ground limestone, 1.0 % salt, 0.03 % iron oxide, and 0.0005 % potassium iodide.

### Wayne Broiler Ration

Dried buttermilk, dried skim milk, liver meal, meat scraps, fish meal, ground yellow corn, fine ground oats, wheat standard middlings, wheat bran, soybean oil meal, choice alfalfa meal, 1.5 % ground limestone, 0.04 % iron oxide, 0.0005 % potassium iodide, 0.25 % salt and sardine oil.

### Wayne Chick Starter

Dried buttermilk, dried skim milk, liver meal, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, fine ground oats, choice alfalfa meal, soybean oil meal, wheat bran, 1.5 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide, 0.25 % salt and sardine oil.

### Wayne Egg & Breeder Mash

Dried buttermilk, dried skim milk, liver meal, meat scraps, fish meal, wheat standard middlings, wheat bran, corn meal, fine ground oat meal, corn gluten feed, choice alfalfa meal, soybean oil meal, fine ground oats, 2 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide and 0.25 % salt.

### Wayne Growing Mash

Dried buttermilk, dried skim milk, liver meal, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, fine ground oats, choice alfalfa meal, soybean oil meal, wheat bran, 1.5 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide and 0.25 % salt.

### Wayne Growing Mash with Sardine Oil

Dried buttermilk, dried skim milk, liver meal, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oat meal, fine ground oats, choice alfalfa meal, soybean oil meal, wheat bran, 1.5 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide, 0.25 % salt and sardine oil.

### Wayne Mash Concentrate

Dried buttermilk, dried skim milk, liver meal, fish meal, peanut oil meal, meat scraps, soybean oil meal, corn gluten meal, corn gluten feed, choice alfalfa meal, 4 % ground limestone, 0.15 % iron oxide, 0.002 % potassium iodide and 0.5 % salt.

### Wayne Poultry Fattener

Ground yellow corn, corn germ oil meal, white hominy feed, rolled oats, oat flour, fine ground oats, wheat standard middlings, wheat red dog, old process linseed oil meal and 1 % salt.

### Wayne Turkey Growing Mash

Dried buttermilk, dried skim milk, liver meal, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oats, choice alfalfa meal, soybean oil meal, corn gluten meal, wheat bran, 1 % charcoal, 2 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide and 0.25 % salt.

### Wayne Turkey Growing Mash with Sardine Oil

Dried buttermilk, dried skim milk, liver meal, meat scraps, fish meal, wheat standard middlings, corn meal, fine ground oats, choice alfalfa meal, soybean oil meal, corn gluten meal, wheat bran, 1 % charcoal, 2 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide, 0.25 % salt and sardine oil.

### Wayne Turkey Starting Mash

Dried buttermilk, dried skim milk, liver meal, meat scraps, fish meal, wheat standard middlings, corn meal, choice alfalfa meal, soybean oil meal, wheat bran, fine ground oats, 1 % charcoal, 2 % ground limestone, 0.06 % iron oxide, 0.0007 % potassium iodide, 0.25 % salt and sardine oil.

## A. P. Ames Co.

**Ames Complete Cycle Ration**

Corn meal, wheat middlings, wheat bran, fish meal, meat scraps, pulverized whole oats, dried milk, alfalfa leaf meal, calcium carbonate, salt, Clo-Trate concentrated cod liver oil.

**Ames Complete Starter and Broller Ration**

Corn meal, wheat middlings, dried skim milk, pulverized whole oats, wheat bran, alfalfa leaf meal, cod fish meal, meat scraps, calcium carbonate, salt, Clo-Trate concentrated cod liver oil.

**Ames Egg Mash**

Corn meal, wheat middlings, pulverized whole oats, wheat bran, cod fish meal, meat scraps, alfalfa leaf meal, dried skim milk, calcium carbonate, salt, Nopco XX concentrated cod liver oil.

**Ames 20% Milk Maker**

Gluten, corn meal (and, or hominy), wheat bran, wheat middlings, linseed meal (and, or soy bean oil meal, and, or cotton seed meal), oat feed, calcium carbonate, bone meal, and salt.

## Arcady Farms Milling Co.

**Arcady 20% Open Formula Production Ration**

Wheat bran, hominy feed, o. p. linseed oil meal, ground white oats, corn gluten feed, cottonseed meal, corn gluten meal, molasses, 1% bone meal, 1% calcium carbonate from limestone, 1% salt.

**Arcady 24% Open Formula Production Ration**

Wheat bran, hominy feed, o. p. linseed oil meal, ground oats, corn gluten feed, cottonseed meal, corn gluten meal, molasses, 1% bone meal, 1% calcium carbonate from limestone, 1% salt.

**Arcady-Wonder Complete All Mash Chick Starter**

Wonderlas (molasses, peanut oil meal, soy bean oil meal, o. p. linseed oil meal, corn oil cake meal), animal liver meal, fish meal, meat scraps, corn meal, wheat middlings, ground oats, ground oat groats, dehydrated alfalfa leaf meal, dried buttermilk, fortified cod liver oil, steamed bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt,  $\frac{3}{4}$  oz. potassium iodide per ton.

**Arcady-Wonder Growing Mash**

Wonderlas (molasses, peanut oil meal, soy bean oil meal, o. p. linseed oil meal, corn oil cake meal), animal liver meal, fish meal, meat scraps, dried buttermilk, corn gluten feed, corn meal, wheat bran, wheat middlings, dehydrated alfalfa meal, fortified cod liver oil, ground oats, bone meal, 1% calcium carbonate from limestone,  $\frac{1}{2}$  of 1% salt,  $1\frac{1}{2}$  oz. potassium iodide per ton.

**Arcady Wonderlas for Poultry**

Molasses, peanut oil meal, corn oil cake meal, o. p. linseed oil meal, soy bean oil meal, 2% calcium carbonate from limestone, 2% salt.

## W. E. Atkinson Co.

**Weaco Dry Mash**

Corn meal, bran, middlings, ground oats, meat scraps, gluten feed, dried skim milk, alfalfa leaf meal, fish meal, calcium carbonate, salt, cod liver oil.

## Barber &amp; Bennett, Inc.

**Big Ben Brand 20% Dairy Feed**

Corn gluten feed, soybean oil meal, wheat bran, corn & rye distillers' grains, ground barley, babassu oil meal, ground screenings from wheat, corn & oats, cane molasses, calcium carbonate from limestone, steamed bone meal, 1% salt, potassium iodide, not less than .0017% iodine.

## Beacon Milling Co., Inc.

**Auburn Dairy Feed**

Corn gluten feed, old process linseed oil meal, soy bean oil meal, ground oats, corn meal, ground grain screenings, cottonseed meal, wheat bran, ground barley, brewer's dried grains, corn distiller's dried grains, molasses, 1% salt, 2% calcium carbonate.

**Beacon Sweet "24"**

Old process linseed oil meal, soy bean oil meal, corn gluten meal, cottonseed meal, corn gluten feed, corn meal, brewer's dried grains, corn distiller's dried grains, wheat bran, wheat middlings, ground oats, ground barley, molasses, 1% salt, 2% calcium carbonate.

**Beacon Sweet "20"**

Old process linseed oil meal, soy bean oil meal, corn distiller's dried grains, cottonseed meal, wheat bran, wheat middlings, brewer's dried grains, corn gluten meal, corn gluten feed, ground barley, corn meal, ground oats, molasses, 2% calcium carbonate, 1% salt.

**Beacon Battery Laying Ration**

Dried skimmilk, dried buttermilk, fish meal, meat scrap, dehydrated alfalfa leaf meal, pulverized heavy oats, pulverized heavy barley, wheat bran, wheat flour middlings, corn meal, fine charcoal,  $\frac{1}{2}\%$  fine salt, fortified cod liver oil, 2% calcium carbonate.

**Beacon CC Pellets**

Dried skimmilk, ground yellow corn, liquid petrolatum, sulphur sublimatum, pulverized heavy barley, wheat bran, fortified cod liver oil,  $\frac{1}{2}\%$  salt.

**Beacon Complete Starting Ration**

Dried skimmilk, meat scrap, fish meal, ground yellow corn, ground hulled oats, pulverized heavy oats, pulverized heavy barley, wheat bran, wheat red dog flour, dehydrated alfalfa leaf meal, fortified cod liver oil, 2% calcium carbonate,  $\frac{1}{2}\%$  salt.



**Beacon Dairy Ration**

Old process linseed oil meal, soy bean oil meal, corn gluten feed, corn distiller's dried grains, ground barley, corn gluten meal, hominy feed, corn meal, cottonseed meal, ground oats, wheat bran, wheat middlings, 2 % calcium carbonate, 1 % salt.

**Beacon Duck Breeders Fitting Ration**

Wheat bran, corn meal, wheat low grade flour, pulverized oats, pulverized barley, alfalfa leaf meal, fish meal, meat scrap,  $\frac{1}{4}$  % salt, 1 % calcium carbonate,  $\frac{1}{2}$  % calcium phosphate.

**Beacon Duck Breeder Pellets**

Dried skimmilk, meat scrap, fish meal, corn meal, pulverized heavy barley, wheat bran, wheat red dog flour, ground oat groats, dehydrated alfalfa leaf meal, fortified cod liver oil, 2 % calcium carbonate,  $\frac{1}{4}$  % salt.

**Beacon Duck Fattening Pellets**

Meat scrap, corn meal, pulverized heavy barley, pulverized heavy oats, wheat bran, wheat middlings, wheat red dog, dehydrated alfalfa leaf meal, old process linseed oil meal, soy bean oil meal, 2 % calcium carbonate,  $\frac{1}{4}$  % salt.

**Beacon Duck Growing Pellets**

Meat scrap, fish meal, corn meal, pulverized heavy barley, pulverized heavy oats, wheat bran, wheat red dog, dehydrated alfalfa leaf meal, old process linseed oil meal, soy bean oil meal, fortified cod liver oil, 2 % calcium carbonate,  $\frac{1}{4}$  % salt.

**Beacon Duck Laying Pellets**

Dried skimmilk, meat scrap, fish meal, corn meal, pulverized heavy barley, pulverized heavy oats, wheat bran, wheat red dog, dehydrated alfalfa leaf meal, old process linseed oil meal, soy bean oil meal, fortified cod liver oil, 2 % calcium carbonate,  $\frac{1}{4}$  % salt.

**Beacon Duck Starting Pellets**

Dried skimmilk, meat scrap, fish meal, wheat bran, wheat red dog, corn meal, pulverized heavy barley, ground oat groats, dehydrated alfalfa leaf meal, soy bean oil meal, fortified cod liver oil, 2 % calcium carbonate,  $\frac{1}{4}$  % salt.

**Beacon Egg Mash**

Dried buttermilk, dried skimmilk, meat scrap, fish meal, pulverized heavy barley, pulverized heavy oats, corn meal, dehydrated alfalfa leaf meal, wheat bran, wheat flour middlings, fortified cod liver oil, 3 % calcium carbonate,  $\frac{1}{2}$  % fine salt, 1 % Protozyme (an enzyme supplying product derived from biochemically processed cereals).

**Beacon Fleshing Pellets**

Dried skimmilk, pulverized heavy oats, pulverized heavy barley, wheat low grade flour, corn meal, corn oil meal, wheat germ meal, fortified cod liver oil, 2  $\frac{1}{2}$  % calcium carbonate, 1 % salt.

**Beacon Growing Mash**

Dried skimmilk, meat scrap, fish meal, pulverized heavy oats, pulverized heavy barley, corn meal, wheat red dog flour, dehydrated alfalfa leaf meal, wheat bran, wheat flour middlings, fortified cod liver oil, 2 % calcium carbonate,  $\frac{1}{2}$  % salt.

**Beacon's Cayuga Laying Mash**

Dried buttermilk, dried skimmilk, fish meal, meat scrap, corn meal, dehydrated alfalfa leaf meal, wheat bran, wheat flour middlings, pulverized heavy barley, pulverized heavy oats, fortified cod liver oil, 3 % calcium carbonate,  $\frac{1}{2}$  % salt.

**Berkshire Coal & Grain Co.****Berkshire Hills Sweet Dairy Feed**

Wheat bran, cottonseed meal, corn gluten feed, linseed oil meal, corn meal, ground oats, brewers grains, calcium carbonate, cane molasses and salt.

**Green Mountain Laying Mash**

Wheat bran, wheat middlings, linseed oil meal, corn meal, fine ground oats, alfalfa meal, meat scraps, bone meal, fish meal, dried skim milk, calcium carbonate, salt, Nopco XX cod liver oil.

**Borden Grain Co.****Borden's Dairy Feed**

Wheat bran, wheat middlings, corn meal or hominy, gluten meal, gluten feed, cottonseed meal, soy bean oil meal, linseed oil meal, calcium carbonate, bone meal, salt.

**Borden's Laying Mash**

Corn meal, wheat bran, wheat middlings, ground oat meal, dried milk, alfalfa leaf meal, fish meal, meat scrap, soy bean oil meal, cod liver oil, calcium carbonate, salt.

**Geo. B. Brown Corp.****Brown's Dairy Feed**

Wheat bran, hominy feed, oat feed, cottonseed meal, calcite flour, distillers grains, corn meal, o. p. linseed meal, corn gluten feed, molasses, bone meal, salt.

**Brown's Egg Mash**

Corn meal, wheat bran, wheat midds, ground oats, meat scraps, fish scraps, dried milk, alfalfa leaf meal, charcoal, calcite flour, salt, and Nopco XX cod liver oil.

**Community Feed Stores, Inc.****Community Chick Mash**

Yellow corn meal or hominy, feeding oat meal, wheat bran, wheat middlings, red dog middlings, alfalfa meal, dried milk, choice meat scraps, fish meal, precipitated bone meal, calcium carbonate, cod liver meal, cod liver oil, salt.

**Community 20 Dairy Ration**

Corn distillers dried grains, 41% cotton seed meal, soya bean meal, corn gluten feed, yellow corn meal or hominy, pure ground oats, wheat bran, molasses, salt, calcium carbonate.

**Community Growing Mash**

Yellow corn meal or hominy, pure ground oats, wheat bran, wheat middlings, alfalfa meal, soya bean meal, dried milk, choice meat scraps, pure fish meal, oyster shell meal, salt, cod liver oil.

**Community Laying Mash**

Yellow corn meal or hominy, pure ground oats, wheat bran, gluten, wheat middlings, choice meat scraps, soya bean meal, dried milk, alfalfa meal, salt, calcium carbonate, oyster shell meal, cod liver oil.

**Hilltop 20 Dairy Ration**

41% cotton seed meal, soya bean meal, corn gluten feed, hominy or corn meal, Vim oat mill feed, wheat bran, corn distillers dried grains, cane molasses, calcium carbonate, salt.

**Nicolas Courcy Grain Co.****Courcy Eastern Laying Mash**

Meal, wheat bran, ground oats, 45% beef scrap, standard middlings, ground wheat, leaf meal alfalfa, fish meal, milk, calcite flour, shell meal, salt, cod liver oil.

**Cover & Palm Co.****C & P Growing Mash**

Dried milk, meat scraps, fish meal, pulverized oats, corn meal, wheat bran, wheat middlings, alfalfa leaf meal, soy bean meal, Vitadine, hominy feed, salt, bone meal, potassium iodide, calcium carbonate, cod liver oil.

**C & P Grade A Laying Mash**

Dried milk, meat scraps, fish meal, corn meal, wheat bran, wheat middlings, pulverized oats, soy bean meal, alfalfa leaf meal, linseed meal, Vitadine, salt, calcium carbonate, potassium iodide, cod liver oil.

**C & P Starter & Broiler Ration**

Dried milk, meat scraps, fish meal, ground hulled oats, soy bean meal, corn meal, wheat bran, wheat red dog flour, wheat middlings, pulverized oats, Vitadine, alfalfa leaf meal, salt, bone meal, potassium iodide, calcium carbonate, cod liver oil.

**Curley Brothers****Crystal Complete Growing Feed**

Ground corn, ground wheat, bran, middlings, oatmeal, oat groats, linseed oil meal, alfalfa leaf meal, meat meal, fish meal, dried skim milk, bone meal, calcium carbonate, salt, cod liver oil concentrates.

**Crystal Complete Laying Mash**

Ground barley, ground corn, ground wheat, oat groats, bran, middlings, alfalfa leaf meal, linseed oil meal, meat meal, fish meal, dried skim milk, calcium carbonate, bone meal, salt, cod liver oil concentrates.

**Crystal 24% Dairy Ration**

Corn gluten meal, corn gluten feed, cottonseed meal, linseed oil meal, distillers grains, hominy feed, ground barley, ground oats, bran and middlings with mill run of screenings, edible bone meal, salt, calcium carbonate.

**Crystal Egg Mash**

Linseed oil meal, yellow hominy feed, yellow corn meal, bran and middlings with mill run of screenings, feeding oat meal, red dog, alfalfa poultry greens, beef scraps, fish scraps, steamed bone meal, dried skim milk, salt, calcium carbonate.

**Crystal Growing Mash**

Cod liver oil, dried skim milk, meat scraps, white fish meal, steamed edible bone meal, alfalfa poultry greens, red dog flour, bran and middlings with mill run of screenings, feeding oat meal, yellow hominy feed, yellow corn meal, calcium carbonate, salt, linseed oil meal.

**Delaware Mills, Inc.****Delaware All Mash Chick Starter**

Cod liver oil, dried skim milk, meat scrap, fish meal, oatmeal, alfalfa leaf meal, corn meal, wheat bran, wheat middlings, wheat reddog flour, bone meal, phosphatic calcium carbonate, charcoal and salt.

**Delaware Growing Mash**

Cod liver oil, dried skim milk, alfalfa leaf meal, meat scrap, fish meal, bone meal, soybean oil meal, corn meal, wheat bran, wheat middlings, wheat flour middlings, oat meal, phosphatic calcium carbonate,  $\frac{1}{2}$  of 1% salt.

**Indian Growing Mash**

Dried skim milk, meat scrap, fish meal, bone meal, soybean oil meal, alfalfa meal, wheat bran, wheat middlings, corn meal, ground barley, ground oats, phosphatic calcium carbonate and salt.

**Indian Laying Mash**

Dried skim milk, meat scrap, fish meal, bone meal, soybean oil meal, corn gluten feed, alfalfa meal, wheat bran, wheat middlings, corn meal, ground barley, ground oats, phosphatic calcium carbonate and salt.

**Indian Sweet 20% Dairy Feed**

Cane molasses, linseed oil meal, corn gluten feed, cottonseed meal, soybean oil meal, peanut oil meal, wheat bran, wheat middlings, corn meal, reground oatfeed, corn distillers grains, phosphatic calcium carbonate and salt.

**Frank Diauto****Diauto's Broiler Ration**

Soy bean meal, yellow meal, bran, wheat flour middlings, ground oats, skim milk, alfalfa leaf meal, 50% meat scraps, fish meal 55%, cod liver oil, calcium carbonate, salt, chicken feed.

**Diauto's Fancy Chick Growing Mash**

Bran, middlings pulverized ground oats, feeding oat meal, 50% scraps, dried milk, soy bean meal, oyster shell meal, alfalfa meal, fish meal, salt, cod liver oil, corn meal.

**Diauto's Dairy Feed**

Gluten feed, corn meal, ground oats, bran, linseed meal, cotton seed meal, salt.

**Diauto's Special Egg Mash**

Linseed meal, cod liver oil, meal, middlings, ground oats, feeding oat meal, oyster shell meal, 50% scraps, fish meal, milk, soy bean meal, ground barley, alfalfa meal, salt, bran.

**F. Diehl & Son, Inc.****Diehl's Dairy Feed**

Bran, brewers grains, cottonseed meal, gluten, linseed meal, corn meal, oat meal mill by-products, ground barley, pure ground oats, wheat middlings, salt, calcium carbonate, bone meal, sweetened.

**Diehl's Dry Mash**

Alfalfa, ground oats, bone, dried milk, charcoal, fish scraps, gluten meal, linseed, meal, meat scraps, middlings and red dog.

**Dietrich & Gambrill, Inc.****All Mash Starter & Grower**

Corn meal, oat meal, wheat middlings, alfalfa leaf meal, malt flour, fish meal, dried buttermilk, cod liver oil, soy bean meal, meat scrap, bone meal, 1% calcium carbonate, 1% salt, potassium iodide.

**All Purpose Complete Ration**

Coarse ground yellow corn, coarse ground wheat, pulverized oats, flour middlings, wheat bran, alfalfa leaf meal, dried buttermilk, meat scrap, fish meal, soy bean meal, steamed bone meal, 1% calcium carbonate, 1% salt, cod liver oil, potassium iodide.

**D. & G. All Mash Turkey Starter**

Pure corn meal, wheat bran, wheat middlings, oat meal, alfalfa leaf meal, soy bean meal, linseed oil meal, meat scrap, fish meal, dried buttermilk, bone meal, 1% calcium carbonate, 1% salt, cod liver oil, potassium iodide.

**D. & G. Breeder Mash**

Wheat bran, wheat middlings, yellow corn meal, pulverized oats, alfalfa leaf meal, fish meal, meat scraps, dried buttermilk, cod liver oil, soy bean meal, malt flour, bone meal, 1% calcium carbonate, 1% salt, potassium iodide.

**D. & G. Dairy Feed**

Cottonseed meal, peanut meal, linseed meal, gluten feed, corn feed meal, wheat bran, ground grain screenings, clipped oat byproducts, oat middlings, oats shorts, oat hulls, molasses, 1% bone meal, 1% calcium carbonate, 1% salt, potassium iodide.

**D. & G. Poultry Conditioning Ration**

Cracked wheat, fine chick corn, corn meal, reddog, pulverized oats, wheat bran, alfalfa leaf meal, dried buttermilk, fish meal, meat scrap, soy bean meal, grit, bone meal, calcium carbonate, salt, mineral oil, peanut oil, cod liver oil, potassium iodide.

**D. & G. Turkey Growing Mash**

Pure corn meal, wheat bran, wheat middlings, pulverized oats, oat meal, alfalfa meal, soy bean meal, linseed meal, meat scrap, dried buttermilk, bone meal, 1% calcium carbonate, 1% salt, potassium iodide.

**Frederick Dairy Feed**

Cottonseed meal, peanut meal, gluten feed, dried brewers grains, wheat bran, corn feed meal, ground grain screenings, clipped oat byproducts, oat middlings, oat shorts, oat hulls, molasses, 1% bone meal, 1% calcium carbonate, 1% salt, potassium iodide.

**Frederick Growing Mash**

Wheat middlings, wheat bran, pulverized oats, corn feed meal, gluten feed, ground barley, soy bean meal, meat scrap, dried buttermilk, alfalfa leaf meal, bone meal, 1% calcium carbonate, 1% salt, potassium iodide, cod liver oil.

**Frederick Laying Mash**

Wheat bran, wheat middlings, corn feed meal, pulverized oats, ground barley, gluten meal, meat scrap, fish meal, alfalfa meal, soy bean meal, bone meal, 1% calcium carbonate, 1% salt, dried buttermilk, potassium iodide, cod liver oil.

**Gambrill's Laying Mash**

Wheat bran, wheat middlings, corn feed meal, linseed meal, soy bean meal, pulverized oats, alfalfa leaf meal, gluten meal, malt flour, meat scrap, fish meal, dried buttermilk, bone meal, 1% calcium carbonate, 1% salt, cod liver oil, potassium iodide.

## East Bridgewater Farmers' Exchange

**Special Dairy Feed**

Brewers' grains, wheat middlings, wheat bran, corn meal or hominy, ground oats, gluten meal, gluten feed, linseed meal, cottonseed meal, beet pulp, soy bean meal, distillers grain, bone meal, molasses and salt.

**Special Growing Feed**

Corn meal, wheat bran, wheat middlings, reddog flour, alfalfa leaf meal, dried milk, fine ground beef scraps, fortified cod liver oil, ground oats, ground barley, ground wheat, fish scraps, soy bean meal, calcite flour.

**Special Mash Feed**

Yellow corn meal, wheat bran, reddog flour, fine ground beef scraps, alfalfa leaf meal, ground oats, ground barley, ground wheat, wheat middlings, dried milk, fortified cod liver oil, soya bean meal, calcium carbonate and fish scraps.

## Eastern Grain Co.

**Eastern 24% Dairy Ration, Sweetened**

Wheat bran, wheat middlings, cottonseed meal, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten, brewers grains, ground barley, corn meal, cane molasses, soy bean meal, high grade edible bone meal, calcium carbonate, and salt.

**Eastern 20% Dairy Ration Sweetened**

Wheat bran, wheat middlings, cottonseed meal, linseed meal, distillers grains, ground oats, Buffalo gluten, Diamond gluten meal, brewers grains, ground barley, corn meal, pure cane molasses, hominy, soy bean meal, high grade edible bone meal, calcium carbonate, salt.

## Eastern States Farmers' Exchange

**Eastern States All-Mash Developer**

E. S. yellow corn meal, wheat bran, wheat flour middlings, E. S. ground oats, E. S. ground barley, alfalfa leaf meal, 41 % prot. soybean oil meal, dried skimmed milk, 50 % protein meat scraps, 58 % protein fish meal, oyster shell meal, dicalcium phosphate, sardine oil, salt.

**Eastern States Combination Mash**

E. S. yellow corn meal, wheat bran, wheat flour middlings, E. S. ground oats, dried skimmed milk, alfalfa leaf meal, 50 % protein meat scraps, 58 % protein fish meal, oyster shell meal, sardine oil with 0.25 % wheat germ oil, dicalcium phosphate, salt.

**Eastern States Developer**

E. S. yellow corn meal, wheat bran, wheat flour middlings, E. S. ground barley, E. S. ground oats, 41 per cent protein soybean oil meal, alfalfa leaf meal, 58 per cent protein fish meal, 50 per cent protein meat scraps, dried skimmed milk, dried whey, oyster shell meal, sardine oil salt, dicalcium phosphate.

**Eastern States Egg Mash**

Wheat standard middlings, E. S. yellow corn meal, wheat bran, E. S. ground barley, 58 per cent protein fish meal, 50 per cent protein meat scraps, 41 per cent protein soybean oil meal, E. S. ground oats, alfalfa leaf meal, corn gluten meal, oyster shell meal, sardine oil, salt.

**Eastern States Fattener Mash**

E. S. yellow corn meal, corn oil meal, ground oat groats, dried skimmed milk, wheat standard middlings, wheat red dog, E. S. ground oats, 41 per cent protein soybean oil meal, salt.

**Eastern States Flushing Mash**

Dried whey, E. S. yellow corn meal, wheat bran, wheat flour middlings, 41 per cent protein soybean oil meal, alfalfa leaf meal, 58 per cent protein fish meal, 50 per cent protein meat scraps, sardine oil.

**Eastern States Highland 16**

Distillers' corn dried grains, oat mill feed (oat hulls, oat shorts, oat middlings), hominy feed, E. S. ground barley, cane molasses, wheat bran, 41 % protein soybean oil meal, 41 % protein cottonseed meal prime quality, corn gluten feed, wheat germ oil meal, calcium carbonate, salt.

**Eastern States Highland 20**

Distillers' corn dried grains, oat mill feed (oat hulls, oat shorts, oat middlings), 41 % protein soybean oil meal, 41 % protein cottonseed meal prime quality, cane molasses, E. S. ground barley, hominy feed, wheat bran, corn gluten feed, wheat germ oil meal, calcium carbonate, salt.

**Eastern States Producer 20**

E. S. yellow corn meal, wheat bran, wheat flour middlings, 50 % protein meat scraps, E. S. ground oats, alfalfa leaf meal, dried skimmed milk, 58 % protein fish meal, 41 % protein soybean oil meal, oyster shell meal, sardine oil with 0.25 % wheat germ oil, dicalcium phosphate, salt.

**Eastern States Producer 17**

E. S. yellow corn meal, wheat flour middlings, wheat bran, E. S. ground oats, 50 % protein meat scraps, 58 % protein fish meal, alfalfa leaf meal, dried skimmed milk, oyster shell meal, sardine oil with 0.25 % wheat germ oil, dicalcium phosphate, salt.

**Eastern States Sixteen**

E. S. yellow corn feed meal, E. S. ground oats, wheat bran, distillers' corn dried grains, cane molasses, corn gluten feed, E. S. ground barley, 41 per cent protein cottonseed meal prime quality, 32 per cent protein old process linseed meal, 41 per cent protein soybean oil meal, wheat germ oil meal, dicalcium phosphate, salt.

**Eastern States Starting and Broiler Ration**

E. S. yellow corn meal, wheat bran, wheat flour middlings, ground oat groats, dried skimmed milk, alfalfa leaf meal, 50 per cent protein meat scraps 58 per cent protein fish meal, oyster shell meal, salt, sardine oil, dicalcium phosphate

**Eastern States 32% Supplement Feed**

41 per cent protein cottonseed meal prime quality, 41 per cent protein soybean oil meal, distillers' corn dried grains, corn gluten meal, 32 per cent protein old process linseed meal, cane molasses, wheat bran, dicalcium phosphate, salt.

**Eastern States Turkey Breeder Mash**

E. S. yellow corn meal, wheat bran, 50% protein meat scraps, wheat flour middlings, dried skimmed milk, alfalfa leaf meal, 41% protein soybean oil meal, E. S. ground oats, 58% protein fish meal, corn gluten meal, oyster shell meal, sardine oil with 0.25% wheat germ oil, dicalcium phosphate, salt.

**Eastern States Turkey-Fat**

E. S. yellow corn meal, wheat bran, wheat flour middlings, 50 per cent protein meat scraps, E. S. ground oats, 41 per cent protein soybean oil meal, alfalfa leaf meal, corn gluten meal, dried skimmed milk, ground oat groats, oyster shell meal, salt.

**Eastern States Turkey-Grow**

E. S. yellow corn meal, wheat bran, wheat flour middlings, 41 per cent protein soybean oil meal, 58 per cent protein fish meal, ground oat groats, alfalfa leaf meal, dried skimmed milk, corn gluten meal, E. S. ground oats, 50 per cent protein meat scraps, oyster shell meal, sardine oil, dicalcium phosphate, salt.

**Eastern States Turkey-Start**

E. S. yellow corn meal, wheat bran, wheat flour middlings, 41 per cent protein soybean oil meal, 58 per cent protein fish meal, ground oat groats, corn gluten meal, alfalfa leaf meal, 50 per cent protein meat scraps, dried skimmed milk, oyster shell meal, sardine oil, dicalcium phosphate, salt.

Michael W. Ellis

**The Ellis Dairy Feed**

Corn meal, wheat middlings, wheat bran, gluten meal, hominy feed, gluten feed, corn distillers grains, cottonseed meal, oil meal, ground oats, calcite flour, salt, edible bone meal. (Wheat feeds may contain screenings not exceeding mill run.)

**The Ellis Poultry Mash**

Wheat bran, wheat middlings, hominy feed, gluten feed, corn meal, rolled oats or feeding oat-meal, alfalfa leaf meal, cod liver oil, beef scraps, dried skim milk or buttermilk, edible bone meal, salt, charcoal, calcite flour. (Wheat feeds may contain screenings not exceeding mill run.)

**The Ellis Special Dairy Feed**

Hominy feed, gluten feed, wheat bran, wheat middlings, Sugared Vim feed, cottonseed meal, gluten meal, salt, calcite flour, alfalfa meal. (Wheat feeds may contain screenings not exceeding mill run.)

Elmore Milling Co., Inc.

**Elmore Breeders Mash**

Wheat germ meal, yellow corn meal, wheat bran, wheat middlings, ground heavy oats, alfalfa leaf meal, fish meal, meat & bone meal, dried skim milk, cod liver oil, cod liver meal, oyster shell flour, salt.

**Elmore Chixsaver**

Dried skim milk, wheat flour midds, wheat bran, corn meal, alfalfa leaf meal, oat flour, meat and bone meal, fish meal, cod liver oil, cod liver meal, corn gluten meal, oyster shell flour, fine table salt.

**Elmore Egg Mash**

Dried skim milk, meat meal, second clear wheat flour, pure ground oats, wheat middlings, corn meal, (No. 2. yellow), wheat bran, alfalfa leaf meal, fish meal, bone meal, cod liver oil, oyster shell flour, salt.

**Elmore Fleshing Pellets**

Corn meal, corn oil meal, pulverized heavy oats, standard midds, low grade wheat flour, corn gluten meal, soya bean oil meal, dried skim milk, cod liver oil, salt.

**Elmore Growing Mash**

Dried buttermilk, meat meal, bone meal, wheat midds, wheat bran, low grade wheat flour, alfalfa leaf meal, corn meal, oat meal, gluten meal, fish meal, cod liver oil, oyster shell flour, salt.

**Elmore M. A. C. Laying Mash**

Alfalfa leaf meal, wheat bran (may contain mill run screenings), corn meal, fish meal, wheat midds, dried skim milk, ground heavy oats, meat scraps, oyster shell flour, cod liver oil, salt.

**Elmore Milk Grains**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, soya bean oil meal, calcium carbonate and salt.

**Elmore Milk Grains Junior**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, soya bean oil meal, calcium carbonate, salt.



**Elmore Milk Grains Junlor Sweet**

Corn distillers grains, wheat bran, old process oil meal, corn meal or hominy feed, barley malt sprouts, corn gluten feed, cotton seed meal, dried brewers' grains, soya bean oil meal, molasses, calcium carbonate, salt.

**Elmore's Sweet Digesto Dairy Feed**

Corn gluten feed, cotton seed meal, wheat bran, coconut oil meal, pulverized wheat screenings, oat meal mill by-products (oat hulls, oat midds and oat shorts), cane molasses, salt.

**Elmore Turkey Fattener**

Yellow corn meal, wheat bran, wheat middlings, ground oats, ground barley, alfalfa leaf meal, soya bean oil meal, corn gluten meal, dried skim milk, meat scraps, oyster shell flour, cod liver oil, salt.

**Elmore Turkey Growing Mash**

Yellow corn meal, wheat bran, wheat middlings, ground heavy oats, ground barley, alfalfa leaf meal, soya bean oil meal, corn gluten meal, dried skim milk, meat scraps, fish meal, oyster shell flour, cod liver oil, salt.

**Emco Feed**

Wheat bran, wheat midds, linseed oil meal, beet pulp, corn gluten feed, corn meal or hominy feed, cotton seed meal, calcium carbonate, salt.

**Granger 24% Dairy Ration**

Wheat bran, wheat middlings, cotton seed meal, soya bean meal, corn gluten feed, cane molasses, reground wheat screenings, ground oats, dried brewers' grains, calcium carbonate, salt.

**Granger 20% Dairy Ration**

Wheat bran, wheat midds, cotton seed meal, corn gluten feed, corn meal or hominy feed, soya bean meal, cane molasses, reground wheat screenings, ground oats, dried brewers' grains, copra oil meal, calcium carbonate, salt.

**Waldorf 20% Dairy Ration**

Soybean oil meal, wheat bran, coconut oil meal, corn gluten feed, corn gluten meal, cotton seed meal, cane molasses, ground oats, pulverized grain screenings, calcium carbonate, salt.

**John W. Eshelman & Sons****Eshelman Certified 20% Dairy Ration**

Corn gluten feed, hominy feed, ground oats, o. p. oil meal, wheat bran, cottonseed meal, soybean oil meal, wheat middlings, corn distillers' dried grains, cane molasses, steamed bone meal, calcium carbonate, salt.

**Eshelman Challenge Dairy Feed**

Cottonseed meal, wheat bran, corn gluten feed, cane molasses, corn gluten meal, ground oats, brewers' dried grains, corn distillers' dried grains, corn meal, o. p. oil meal, soybean oil meal, reground grain screenings from wheat, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Lancaster 20 Dairy Feed**

Wheat bran, cottonseed meal, ground oats, corn gluten feed, cane molasses, brewers' dried grains, corn distillers' dried grains, corn meal, o. p. oil meal, soybean oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Pennsy 16 Dairy Feed**

Wheat bran, cottonseed meal, cane molasses, corn gluten feed, brewers' dried grains, o. p. oil meal, soybean oil meal, reground grain screenings from wheat, oat mill feed (oat midds, oat hulls, oat shorts), 1% bone meal, 1% salt, 1% calcium carbonate.

**Eshelman Pennsy Laying Mash**

Corn meal, wheat middlings, meat scrap, wheat bran, ground oats, alfalfa meal, soybean oil meal, cane molasses, fish meal, corn gluten feed, o. p. oil meal, 1% bone meal, 1% calcium carbonate,  $\frac{1}{2}$ % salt.

**Eshelman Red Rose All Mash Starter**

Corn meal, wheat bran, wheat middlings, pure oat meal, meat scrap, fish meal, alfalfa leaf meal, dried buttermilk, dried whey, o. p. oil meal,  $2\frac{1}{2}$ % calcium carbonate, 1% bone meal,  $\frac{1}{2}$ % salt, fortified cod liver oil.

**Eshelman Red Rose Broiler Ration**

Pure corn meal, wheat bran, wheat middlings, oat meal, pulverized oats, meat scrap, wheat red dog, soybean oil meal, alfalfa meal, dried buttermilk, dried whey, o. p. oil meal, fish meal, 1% calcium carbonate,  $\frac{1}{2}$ % salt, fortified cod liver oil.

**Eshelman Red Rose 24 Dairy Feed**

Cottonseed meal, wheat bran, corn gluten feed, cane molasses, corn gluten meal, ground oats, brewers' dried grains, corn distillers' dried grains, corn meal, o. p. oil meal, soybean oil meal, 1% bone meal, 1% calcium carbonate, 1% salt.

**Eshelman Red Rose Growing Mash**

Wheat middlings, corn meal, wheat bran, meat scrap, pulverized oats, corn gluten feed, oat meal, soybean oil meal, hominy feed, o. p. oil meal, fish meal, dried buttermilk, dried whey, fine alfalfa meal, 1% calcium carbonate,  $\frac{1}{2}$ % salt, fortified cod liver oil.

**Eshelman Red Rose Laying Mash**

Wheat middlings, corn meal, meat scrap, wheat bran, corn gluten feed, ground oats, o. p. oil meal, fish meal, soybean oil meal, hominy feed, fine alfalfa meal, dried buttermilk, dried whey, 1% calcium carbonate,  $\frac{1}{2}$ % salt, fortified cod liver oil.

## Farm Service Stores, Inc.

**C Dairy Ration**

Corn meal, hominy, cottonseed meal, linseed oil meal, corn gluten feed, wheat bran (with wheat screenings not exceeding mill run), wheat midds (with wheat screenings not exceeding mill run), ground oats, bone meal, calcium carbonate, salt, (with or without molasses).

**C Growing Mash**

Corn meal, mixed feed, ground oats, meat scraps, dried milk, fish scraps, alfalfa meal, calcium carbonate, salt, cod liver oil.

**C Laying Mash**

Corn meal, mixed feed, corn gluten feed, linseed oil meal, meat scraps, alfalfa meal, ground oats, soya bean oil meal, calcium carbonate, bone meal, fish meal, salt.

**18% Dairy Ration**

Corn meal, hominy, wheat bran (with wheat screenings not exceeding mill run), corn gluten feed, cottonseed meal, linseed oil meal, dried brewers grains, soya bean oil meal, molasses, oat midds, calcium carbonate, ground wheat screenings, malt sprouts, ground oats, salt.

**Diamond A Dairy Ration**

Corn meal, hominy, linseed oil meal, corn gluten feed, wheat bran (with wheat screenings not exceeding mill run), dried brewers grains, corn gluten meal, cottonseed meal, stock feed, calcium carbonate, salt.

**Diamond C Dairy Feed**

Wheat bran (with wheat screenings not exceeding mill run), wheat midds (with wheat screenings not exceeding mill run), corn meal, hominy, cottonseed meal, linseed oil meal, beet pulp, corn gluten feed, corn gluten meal, salt.

**Lawrence Cow Ration**

Wheat bran (with wheat screenings not exceeding mill run), corn meal, hominy, ground oats, pulverized oats, corn gluten feed, cottonseed meal, linseed oil meal, dried brewers grains, ground wheat screenings, molasses, salt.

**New England Dairy Ration**

Corn gluten meal, corn gluten feed, wheat bran (with wheat screenings not exceeding mill run), yellow corn meal, linseed oil meal, cottonseed meal, hominy, ground oats, molasses, calcium carbonate, salt.

**North Star 24% Dairy Feed**

Corn meal, hominy, ground oats, soya bean oil meal, dried brewers grains, distillers' grains, wheat bran (with wheat screenings not exceeding mill run), corn gluten meal, corn gluten feed, cottonseed meal, linseed oil meal, molasses, calcium carbonate, ground barley, ground wheat screenings, bone meal, salt.

**North Star 20% Dairy Feed**

Corn meal, hominy, soya bean oil meal, dried brewers grains, corn gluten feed, corn gluten meal, wheat bran (with wheat screenings not exceeding mill run), cottonseed meal, linseed oil meal, ground wheat screenings, beet pulp, molasses, oat midds, calcium carbonate, bone meal, salt.

**North Star Growing Mash**

Corn meal, pulverized oats, alfalfa meal, wheat bran (with wheat screenings not exceeding mill run), wheat midds (with wheat screenings not exceeding mill run), corn gluten feed, linseed oil meal, calcium carbonate, meat scraps, fish meal, dried milk, soya bean oil meal, salt, cod liver oil.

**North Star Laying Mash**

Corn meal, pulverized oats, alfalfa meal, wheat bran (with wheat screenings not exceeding mill run), wheat midds (with wheat screenings not exceeding mill run), corn gluten feed, ground barley, soya bean oil meal, meat scraps, calcium carbonate, fish meal, dried milk, salt, (with or without cod liver oil).

## First National Stores, Inc.

**Henfield Egg Mash**

Hominy, corn meal, wheat middlings, wheat flour middlings, wheat bran, meat scraps, corn gluten feed, pulverized oats, old process linseed oil meal, fish meal, alfalfa meal, dried butter-milk, fortified cod liver oil, steamed bone meal, 1% calcium carbonate,  $\frac{1}{2}$  of 1% salt.

## Flory Milling Co., Inc.

**Flory's "All-Mash" Chick Starter**

Oatmeal, yellow corn meal, wheat bran, standard wheat middlings, choice fine alfalfa meal, dried tomato pulp, ground barley, dried skim milk, fish meal, meat scrap, liver meal, soybean meal, linseed oil meal, ground wheat, pulverized oats, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's Dairy Feed**

Cottonseed meal, o. p. oil meal, peanut meal, ground white oats, coconut oil meal, soybean meal, corn gluten feed, corn gluten meal, malt sprouts, corn distillers' grains, dried brewers' grains, alfalfa meal, wheat bran (containing screenings not exceeding mill run), standard wheat middlings, molasses, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's 24% Special Dairy Feed**

Cottonseed meal, corn gluten feed, peanut meal, ground white oats, corn gluten meal, wheat bran (containing screenings not exceeding mill run), coconut oil meal, corn distillers' grains, dried brewers' grains, malt sprouts, molasses, soybean meal, alfalfa meal, corn meal, standard wheat middlings, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's 20% Special Dairy Feed**

Cottonseed meal, gluten meal, gluten feed, corn meal, alfalfa meal, ground oats, coconut oil meal peanut meal, soybean meal, corn distillers' grains, dried brewers' grains, malt sprouts, wheat bran (containing screenings not exceeding mill run), essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's Growing Mash**

Yellow corn meal, dried skim milk, choice alfalfa meal, dried tomato pulp, ground white oats, ground barley, standard wheat middlings, wheat bran, corn gluten meal, meat scrap, liver meal, fish meal, soybean meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

**Flory's 3 in 1 Starter-Growing-Laying Mash**

Alfalfa meal, fish meal, oatmeal, pure corn meal, dried buttermilk, meat scrap, soybean meal, ground wheat, ground barley, wheat bran, standard wheat middlings, tomato pulp, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Flory's 32% Protein Supplement Mash**

Fish meal, soybean oil meal, meat scrap, liver meal, dried skim milk, corn gluten meal, standard wheat middlings, wheat bran, coconut oil meal, alfalfa leaf meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

**Golden Egg Laying Mash**

Dried buttermilk, meat scrap, fish meal, dried tomato pulp, soybean meal, yellow corn meal, wheat flour middlings, ground barley, wheat bran, ground white oats, choice alfalfa meal, corn gluten meal, coconut oil meal, cod liver oil, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Record Dairy Feed**

O. p. oil meal, cottonseed meal, peanut meal, soybean meal, corn gluten feed, standard wheat middlings, corn meal, wheat bran (containing screenings not exceeding mill run), corn distillers' grains, dried brewers' grains, malt sprouts, ground oats, molasses, alfalfa meal, coconut oil meal, essential minerals (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt).

**Fred A. Fountain****Fountains' Buttermilk Laying Mash**

Dry buttermilk or dry skim milk, beef scrap, fish meal, alfalfa meal, ground oat groats, second clear flour, bran, middlings, yellow corn meal, gluten, calcium carbonate, table salt.

**J. B. Garland & Son****Garland Chick Starter**

Cod liver oil, corn meal, ground oats, oat meal, dried milk, ground wheat, ground barley, fish meal, meat scraps, wheat bran, wheat middlings, alfalfa leaf meal, calcium carbonate and salt.

**Garland Complete Starting and Broiler Mash**

Alfalfa leaf meal, fish meal, meat scraps, ground wheat, dried milk, cod liver oil, ground barley, ground oats, corn meal, wheat bran, wheat middlings, calcium carbonate and salt.

**Garland 20% Dairy Ration**

Soya bean meal, brewers dried grains, linseed oil meal, cottonseed meal, corn gluten feed, distillers dried grains, malt sprouts, palm kernel meal, wheat bran, middlings, corn meal, fish meal, molasses, calcium carbonate and salt.

**Garland 24% Dairy Ration**

Soya bean meal, brewers dried grains, distillers dried grains, cottonseed meal, linseed oil meal, corn gluten feed, wheat bran, middlings, malt sprouts, corn gluten meal, palm kernel meal, corn meal, fish meal, molasses, calcium carbonate and salt.

**Garland Growing Mash**

Alfalfa leaf meal, fish meal, meat scraps, linseed oil meal, dried milk, wheat bran, wheat middlings, soybean meal, ground oats, ground wheat, corn meal, calcium carbonate and salt. (With or without cod liver oil.)

**Garland Laying Mash**

Alfalfa leaf meal, soybean meal, fish meal, meat scraps, dried milk, linseed oil meal, wheat bran, wheat middlings, ground oats, ground wheat, corn meal, calcium carbonate and salt. (With or without cod liver oil.)

**Royal 24% Dairy Ration**

Soya bean meal, ground corn, ground oats, corn gluten feed, wheat and wheat bran processed, distillers dried grains, cottonseed meal, palm kernel meal, molasses, calcium carbonate and salt.

**Royal 20% Dairy Ration**

Soya bean meal, corn gluten feed, distillers dried grains, wheat and wheat bran processed, cottonseed meal, palm kernel meal, ground corn, ground oats, molasses, calcium carbonate and salt.

**Royal Laying Mash**

Alfalfa meal, corn meal, ground oats, ground wheat, dried milk, wheat bran, wheat middlings, cod liver oil, fish meal, meat scraps, linseed oil meal, soya bean meal, calcium carbonate and salt.

**W. K. Gilmore & Sons, Inc.****Neponset Poultry Mash**

Wheat bran, wheat middlings, corn meal, ground oats, alfalfa, beef scraps, fish scraps, linseed oil meal, corn gluten, ground rolled oats, calcite flour, dried skim milk, fine salt, soy bean meal.



**Conference Mash**

Yellow corn meal, standard wheat bran, wheat flour middlings, pure ground oats, meat scraps 50%, pure fish meal 55%, alfalfa leaf meal, milk, calcite flour, cod liver oil, dicalcium phosphate, salt.

Goode Grain Co.

**Goode Laying Mash**

Yellow corn meal, soy bean meal, wheat middlings, wheat bran, ground oats, meat scraps, fish meal, dried skim or buttermilk, alfalfa meal, calcium carbonate, salt, cod liver oil, with & without Vitidine a mineral concentrate.

**Goode Starting & Growing Mash**

Yellow corn meal, soy bean meal, wheat middlings, wheat bran, ground oats, meat scraps, fish meal, dried skim or buttermilk, alfalfa meal, calcium carbonate, salt, cod liver oil, with & without Vitidine a mineral concentrate.

D. H. Grandin Milling Co.

**Grandin's Baby Chick Starter**

Dried buttermilk, fine ground hulled oats, ground wheat, corn meal, hominy feed, wheat middlings, alfalfa leaf meal, calcium carbonate, bone meal, one half of one per cent salt and liver oil.

**Grandin's 20% Dairy Feed (Sweetened)**

Cane molasses, cottonseed meal, soybean oil meal, linseed oil meal, corn distillers dried grains, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), ground oats, corn meal, corn feed meal, hominy feed, steamed bone meal, calcium carbonate, salt and potassium iodide.

**Grandin's 24% Dairy Feed (Sweetened)**

Cane molasses, cottonseed meal, soybean oil meal, linseed oil meal, corn gluten meal, corn distillers dried grains, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), ground oats, corn meal, corn feed meal, hominy feed, steamed bone meal, calcium carbonate, salt and potassium iodide.

**Grandin's Growing Mash**

Dried buttermilk, ground meat and bone, fish meal, soybean oil meal, corn gluten feed, alfalfa leaf meal, ground yellow corn, hominy feed, pulverized oats, ground barley, wheat bran, wheat middlings, calcium carbonate, salt and potassium iodide.

**Grandin's Laying Mash**

Dried buttermilk, ground meat and bone, fish meal, soybean oil meal, corn gluten meal, corn gluten feed, ground yellow corn, hominy feed, alfalfa leaf meal, pulverized oats, ground barley, wheat bran, wheat middlings, calcium carbonate, salt and potassium iodide.

**Grandin's Milk Maker**

Dried beet pulp, cottonseed meal, soybean oil meal, linseed oil meal, corn distillers dried grains, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), ground oats, corn meal, corn feed meal, hominy feed, steamed bone meal, calcium carbonate, salt and potassium iodide.

**Grandin's 16% Dairy Feed (Sweetened)**

Cane molasses, cottonseed meal, soybean oil meal, linseed oil meal, corn distillers dried grains, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), ground oats, corn meal, corn feed meal, hominy feed, steamed bone meal, calcium carbonate, salt and potassium iodide.

**Grandin's Start-To-Finish Mash**

Concentrated cod liver oil, dried buttermilk, ground meat and bone, fish meal, soybean oil meal, corn gluten feed, alfalfa leaf meal, ground yellow corn, hominy feed, pulverized oats, ground barley, wheat bran, wheat middlings, calcium carbonate, salt and potassium iodide.

**Grandin's Turkey Starter**

Concentrated cod liver oil, dried buttermilk, ground meat and bone, fish meal, corn gluten meal, soybean oil meal, alfalfa leaf meal, ground hulled oats, hominy feed, ground yellow corn, ground wheat, pulverized oats, ground barley, wheat bran, wheat middlings, calcium carbonate, salt and potassium iodide.

**Grandin's Twin Six Dairy Feed**

Cottonseed meal, soybean oil meal, linseed oil meal, corn distillers dried grains, corn gluten feed, wheat bran and wheat middlings (with ground wheat screenings not exceeding mill run), alfalfa meal, ground oats, corn meal, corn feed meal, hominy feed, steamed bone meal, calcium carbonate, salt and potassium iodide.

**M-S (Money-Saver) 20% Dairy Feed (Sweetened)**

Cane molasses, cottonseed meal, soybean oil meal, linseed oil meal, corn gluten feed, corn distillers dried grains, brewers dried grains, wheat bran, wheat middlings, 10% ground grain screenings from corn, wheat, oats and barley, oat mill feed (oat hulls, oat shorts, oat middlings), steamed bone meal, calcium carbonate, salt and potassium iodide.

Great Atlantic & Pacific Tea Co.

**Daily Egg Laying Mash Feed**

Ground oats, ground barley, soybean oil meal, old process linseed oil meal, corn gluten meal, wheat standard middlings, wheat bran, alfalfa meal, corn feed meal, dried buttermilk, dried skim milk, meat and bone scrap, fish meal, flour middlings, cod liver oil, cod liver meal, calcium carbonate from limestone 2 1/2%, steamed bone meal 1 1/2%, salt 1/4 of 1%, red iron oxide .02%, and .0015% potassium iodide.

**Daily Growth Chick Starter**

Dried buttermilk, dried skimmed milk, meat and bone scrap, wheat flour, wheat standard middlings, ground corn, corn feed meal, ground oats, ground oat groats, old process linseed oil meal, alfalfa meal, cod liver oil, calcium carbonate from limestone 1%, salt  $\frac{1}{2}$  of 1%, steamed bone meal  $\frac{1}{2}$  of 1%.

**Daily Growth Growing Mash**

Meat and bone scrap, dried buttermilk, dried skimmed milk, wheat bran, alfalfa meal, wheat standard middlings, corn feed meal, ground oats, ground barley, old process linseed oil meal, corn gluten feed, cod liver oil, calcium carbonate from limestone 1%, steamed bone meal  $\frac{1}{2}$ %, salt  $\frac{1}{2}$  of 1%.

**Milky Way Dairy Feed 20%**

Corn feed meal, dried grains from barley, malt and corn, wheat bran, cottonseed meal, wheat standard middlings, ground oats, ground barley, molasses, soybean oil meal, old process linseed oil meal, corn gluten meal, calcium carbonate from limestone 1%, salt 1%, malt sprouts, corn gluten feed.

Hales & Hunter Co.

**Morning Glory Egg Mash**

Whole ground corn, ground oats, wheat bran, wheat middlings, corn gluten feed, soy bean oil meal, alfalfa meal, dried buttermilk, meat scraps, granulated charcoal  $\frac{1}{2}$ %, and minerals. (Ground limestone 1%, salt 1%.) Cod liver oil, sardine oil.

**Red Comb All-Mash**

Whole ground corn, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean oil meal, pulverized oats, fish meal, dried buttermilk, dried whey, steamed bone meal and not over 1 $\frac{1}{2}$ % minerals. (Calcium carbonate  $\frac{1}{2}$ %, sodium chloride  $\frac{1}{2}$ %, granulated charcoal  $\frac{1}{4}$ %, iron sulphate  $\frac{1}{8}$ %, sulphur  $\frac{1}{8}$ %). Cod liver oil, sardine oil.

**Red Comb Batry Fed Layer**

Whole ground corn, feeding oat meal, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean oil meal, pulverized oats, fish meal, dried buttermilk, steamed bone meal, and not over 1 $\frac{1}{2}$ % minerals. (Calcium carbonate  $\frac{1}{2}$ %, sodium chloride  $\frac{1}{2}$ %, granulated charcoal  $\frac{1}{4}$ %, iron sulphate  $\frac{1}{8}$ %, sulphur  $\frac{1}{8}$ %). Cod liver oil, sardine oil.

**Red Comb Broiler Mash**

Whole ground corn, fine ground feeding oat meal, pulverized oats, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean oil meal, fish meal, dried buttermilk, steamed bone meal and not over 3% minerals. (Calcium carbonate 1%, sodium chloride 1%, granulated charcoal  $\frac{1}{2}$ %, iron sulphate  $\frac{1}{4}$ %, sulphur  $\frac{1}{4}$ %). Sardine oil, cod liver oil.

**Red Comb Chick Starter**

Whole ground corn, ground oat groats, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean oil meal, pulverized oats, fish meal, dried buttermilk, steamed bone meal and not over 3% minerals. (Calcium carbonate 1%, sodium chloride 1%, granulated charcoal  $\frac{1}{2}$ %, iron sulphate  $\frac{1}{4}$ %, sulphur  $\frac{1}{4}$ %). Sardine oil, cod liver oil.

**Red Comb Egg Mash**

Whole ground corn, feeding oat meal, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean oil meal, pulverized oats, fish meal, dried buttermilk, steamed bone meal and not over 3% minerals. (Calcium carbonate 1%, sodium chloride 1%, granulated charcoal  $\frac{1}{2}$ %, iron sulphate  $\frac{1}{4}$ %, sulphur  $\frac{1}{4}$ %). Sardine oil, cod liver oil.

**Red Comb Growing Mash**

Whole ground corn, fine ground feeding oat meal, pulverized oats, wheat bran, wheat middlings, corn gluten feed, meat scraps, alfalfa meal, soy bean oil meal, fish meal, dried buttermilk, steamed bone meal and not over 3% minerals. (Calcium carbonate 1%, sodium chloride 1%, granulated charcoal  $\frac{1}{2}$ %, iron sulphate  $\frac{1}{4}$ %, sulphur  $\frac{1}{4}$ %). Sardine oil, cod liver oil.

**Red Comb Turkey Breeder**

Whole ground corn, feeding oat meal, wheat bran, wheat middlings, corn gluten meal, meat scraps, alfalfa meal, soy bean oil meal, pulverized oats, fish meal, dried buttermilk, steamed bone meal and not over 3% minerals. (Calcium carbonate 1%, sodium chloride 1%, granulated charcoal  $\frac{1}{2}$ %, iron sulphate  $\frac{1}{4}$ %, sulphur  $\frac{1}{4}$ %). Sardine oil, cod liver oil.

D. Harbeck

**Welcome Dairy Feed**

Bran, beet pulp, cottonseed meal, corn gluten meal, ground oats, hominy or corn feed meal, oil meal, middlings, steam bone meal, calcium carbonate, salt.

**Welcome Growing Mash**

Corn meal, bran, flour middlings, ground oats, alfalfa meal, meat scraps, fish meal, dried skimmed milk or buttermilk, ground barley, hominy feed, oil meal, ground wheat, bone meal, shell flour, salt, cod liver oil.

**Welcome Laying Mash**

Corn meal, wheat bran, flour middlings, ground oats, meat scraps, fish meal, alfalfa meal, dried skimmed milk or buttermilk, salt, shell flour, cod liver oil.

**Welcome Starter & Broiler Ration**

Corn meal, bran, flour middlings, ground oat groats or feeding oat meal, dry skimmed milk or buttermilk, alfalfa meal, meat scraps, fish meal, shell flour, salt, cod liver oil.

D. B. Hodgkins' Sons

**Hodgkins' Dairy Ration**

Wheat bran, hominy, ground oats, corn gluten feed, corn meal, cottonseed meal, soy bean meal, linseed meal, beet pulp, brewers grains, molasses, calcium carbonate and salt.

**Hodgkins' Growing Mash**

Corn meal, wheat bran, wheat middlings, flour middlings, ground oats, alfalfa meal, dried skim milk, soy bean oil meal, meat scraps, fish meal, oyster shell meal, salt and cod liver oil.

**Hodgkins' Milk Ration**

Wheat bran, corn gluten feed, cottonseed meal, linseed meal, soy bean meal, oat feed, corn meal, hominy meal, brewers grain, beet pulp, molasses, bone meal, ground limestone and salt.

**Hodgkins' Poultry Mash**

Ground corn, oats, middlings and bran (with screenings not to exceed mill run), corn gluten feed, linseed meal, ground meat scraps, calcium carbonate, dried skim milk or dried butter-milk, dairy salt, fish meal, alfalfa leaf meal and cod liver oil.

**Horvitz Grain Co.****Wantmore Dairy Ration**

Hominy feed or corn meal, wheat bran, ground oats, gluten feed and gluten meal, linseed meal, cottonseed meal, wheat middlings, calcium carbonate, salt.

**Wantmore Dairy with Beet Pulp**

Hominy feed or corn meal, wheat bran, gluten feed & gluten meal, linseed meal, cottonseed meal, wheat middlings, salt, beet pulp, ground oats, calcium carbonate.

**Wantmore Sweetened Special Dairy 24%**

Soy bean oil meal, cottonseed meal, oat meal mill by-products (oat middlings, oat shorts and oat hulls), wheat middlings, wheat bran, pure cane molasses, distillers' dried grains, corn gluten feed, calcium carbonate and dairy salt.

**Wantmore Sweetened Special Dairy 20%**

Soy bean oil meal, cottonseed meal, oat meal mill by-products (oat middlings, oat shorts and oat hulls), wheat middlings, wheat bran, pure cane molasses, distillers' dried grains, corn gluten feed, hominy feed, calcium carbonate and salt.

**Jaquith & Co.****Jaquith & Co. Dairy Ration**

Wheat bran & middlings, cottonseed meal, oil meal, soya bean meal, salt, gluten feed, alfalfa, ground oats & corn, dried grains, molasses.

**Jaquith & Co. Growing Mash**

Ground corn, wheat and oats, soy bean meal, meat and bone meal, salt, dried milk, alfalfa, cod liver oil, and oil meal.

**Jaquith & Co. Laying Mash**

Ground corn, wheat and oats, gluten feed, oil meal, meat scraps, dried milk, soy bean meal, alfalfa meal, salt, and cod liver oil.

**Jaquith & Co. Starting Feed**

Ground corn, oats and wheat, dried milk, salt, alfalfa, cod liver oil.

**Kasco Mills, Inc.****Apex Broiler Ration**

Ground barley, corn meal, pulverized oats, wheat bran, wheat middlings, linseed oil meal, meat scrap, bone meal, fish meal, milk sugar feed, dried skim milk, tested cod liver oil, calcite, salt, soybean oil meal, alfalfa meal.

**Apex Laying Mash**

Wheat bran, wheat middlings, corn meal, linseed oil meal, soybean oil meal, pulverized oats, ground barley, meat scrap, bone meal, fish meal, dried skim milk, milk sugar feed, Lactoflavin,  $\frac{3}{4}$  of 1% salt, calcite, tested cod liver oil, alfalfa meal.

**Apex Starter**

Oatmeal, wheat middlings, wheat bran, corn meal, meat scrap, bone meal, fish meal, linseed oil meal, soybean oil meal, dried skim milk, milk sugar feed, Lactoflavin, alfalfa leaf meal,  $\frac{1}{2}$  of 1% salt, calcite, tested cod liver oil.

**Beatsall Milk Grains**

Wheat bran, wheat middlings, linseed oil meal, corn distillers grains, corn gluten feed, corn gluten meal, cottonseed meal, soybean oil meal, hominy feed,  $\frac{3}{4}$  of 1% salt, 1% calcite, beet pulp, molasses.

**Kasco All Mash Chick Food**

Wheat reddog, oatmeal, wheat middlings, wheat bran, corn meal, meat scrap, fish meal, bone meal, linseed oil meal, soybean oil meal, dried skim milk, milk sugar feed, Lactoflavin,  $\frac{1}{2}$  of 1% salt, tested cod liver oil, calcite, alfalfa leaf meal.

**Kasco All Mash Laying Food**

Corn meal, pulverized oats, oatmeal, wheat bran, wheat middlings, wheat reddog, linseed oil meal, soybean oil meal, ground barley, meat scrap, bone meal, fish meal, dried skim milk, milk sugar feed, Lactoflavin,  $\frac{1}{2}$  of 1% salt, calcite, tested cod liver oil, alfalfa meal.

**Kasco Broiler Ration**

Wheat bran, wheat middlings, wheat reddog, linseed oil meal, corn meal, ground oatmeal, meat scrap, bone meal, alfalfa leaf meal, milk sugar feed, Lactoflavin, dried skim milk, tested cod liver oil, salt, calcite, soybean oil meal, fish meal.

**Kasco Laying Mash**

Wheat bran, wheat middlings, wheat reddog, corn meal, linseed oil meal, soybean oil meal, pulverized oats, ground oatmeal, meat scrap, bone meal, fish meal, dried skim milk, milk sugar feed, Lactoflavin,  $\frac{3}{4}$  of 1% salt, calcite, tested cod liver oil, alfalfa meal.

**Kasco Open Formula 20% Dairy Ration**

Wheat bran, wheat middlings, ground barley, ground oats, malt sprouts, dried brewers grains, corn distillers grains, corn gluten feed, soybean oil meal, 41 % cottonseed meal, hominy feed, cane molasses, salt, calcite.

**Kasco Sweet 16% Dairy Feed**

Wheat bran, corn gluten feed, corn gluten meal, cottonseed meal, soybean oil meal, ground oats, ground barley, ground wheat screenings, corn meal, oat mill feed (oat midds, oat hulls, oat shorts), malt sprouts, dried brewers grains, corn distillers grains, molasses, 1 % salt, 1 % calcite.

**Larrowe Milling Co.****Larro The Ready Ration for Dairy Cows**

Cottonseed meal, yellow corn meal, wheat standard middlings, soybean oil meal, o. p. linseed oil meal, corn gluten feed, corn distillers' dried grains, dried beet pulp, wheat bran,  $\frac{1}{2}$  % limestone, 1 % salt.

**Larro Broiler Feed**

Yellow corn meal, wheat standard middlings, alfalfa meal, wheat bran, meat and bone scraps, dried buttermilk, soybean oil meal, fish meal, dried skimmed milk, ground oats, cod liver oil concentrate, 2 % limestone,  $\frac{1}{2}$  % salt.

**Larro Chick Builder**

Wheat bran, yellow corn meal, wheat standard middlings, ground barley, meat and bone scraps, soybean oil meal, fish meal, alfalfa meal, dried skimmed milk, dried buttermilk, ground oats, cod liver oil concentrate,  $2\frac{1}{2}$  % limestone,  $\frac{1}{2}$  % salt.

**Larrowe's 16 Dairy Feed**

Cottonseed meal, corn gluten feed, corn distillers' dried grains, wheat standard middlings, o. p. linseed oil meal, yellow corn meal, dried beet pulp, wheat bran, 1 % salt.

**Larro Egg Mash**

Wheat bran, yellow corn meal, wheat standard middlings, ground barley, meat and bone scraps, soybean oil meal, fish meal, alfalfa meal, dried skimmed milk, dried buttermilk, ground oats, cod liver oil concentrate,  $2\frac{1}{2}$  % limestone,  $\frac{1}{2}$  % salt.

**Larro Turkey Adult Mash**

Wheat bran, yellow corn meal, wheat standard middlings, ground barley, meat and bone scraps, soybean oil meal, fish meal, alfalfa meal, dried skimmed milk, dried buttermilk, ground oats, cod liver oil concentrate,  $2\frac{1}{2}$  % limestone,  $\frac{1}{2}$  % salt.

**Mansfield Coal & Grain Co.****Manco 20% Dairy**

Corn meal (or hominy), soya bean meal, oil meal, dried brewers grains, ground wheat screenings, wheat bran (with wheat screenings not exceeding mill run), corn gluten feed, cottonseed meal, molasses, calcium carbonate, bone meal, salt, beet pulp, corn gluten meal, oat midds.

**Manco Laying Mash**

Corn meal, ground oats, alfalfa meal, wheat middlings, wheat bran, gluten feed, soya bean meal, beef scraps, fish meal, dried milk, calcium carbonate, salt and cod liver oil.

**Mansfield Milling Co.****Mansfield Chick-Growing Feed**

Corn meal, wheat middlings, wheat bran, red dog flour, oatmeal, fish scraps, meat scraps, dried milk, alfalfa leaf meal, soy bean oil meal, Vitamelk, charcoal, calcium carbonate, salt and cod liver oil.

**Mansfield Cow-Ration**

Corn meal, ground barley, wheat bran, wheat middlings, gluten feed, ground oats, linseed oil meal, cottonseed meal, gluten meal, soy bean oil meal and salt, calcium carbonate and bone meal.

**Maritime Milling Co., Inc.****B-B Complete Chick Starter Ration**

Cod liver oil, kelp meal, milk sugar feed, dried buttermilk, dehydrated alfalfa leaf meal, wheat screenings, wheat bran, ground wheat, corn gluten meal, corn meal, pulverized heavy oats, pulverized barley, soya bean oil meal, ground oat meal, meat and bone meal, fish meal, calcium carbonate, salt and potassium iodide.

**B-B Layer & Breeder Mash**

Cod liver oil, liver meal, milk sugar feed, dried buttermilk, dehydrated alfalfa leaf meal, wheat bran and wheat middlings with mill run ground screenings, soya bean oil meal, corn gluten meal, corn meal, pulverized heavy oats, pulverized barley, ground oat meal, meat and bone meal, fish meal, calcium carbonate, salt and potassium iodide.

**B-B Daisy Egg Mash**

Cod liver oil, dried buttermilk, alfalfa meal, wheat bran and wheat middlings with mill run ground screenings, soya bean oil meal, corn gluten meal, corn meal, pulverized barley, pulverized oats, meat and bone meal, fish meal, calcium carbonate and salt.

**Hi-Test Dairy Feed 20% Pro. Sweetened**

Dried brewers grains, cotton seed meal, corn gluten feed, soya bean oil meal, hominy feed, ground oats, corn meal, cleaned, pulverized and bolted grain screenings, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

**Marmico 16% Protein Dairy Feed**

Dried brewers grains, soya bean oil meal, cotton seed meal, corn gluten feed, corn meal, cleaned pulverized and bolted grain screenings, wheat bran, molasses, steamed bone meal, calcium carbonate and salt.

**Merrimack Farmers' Exchange, Inc.****Merrimack All Mash**

Corn meal, wheat (cracked), ground oats, wheat bran, soybean oil meal, alfalfa meal, meat scraps, fish meal, dried milk, calcium carbonate, edible bone, oat groats, salt and tested oil.

**Merrimack Chick Starter**

Soybean oil meal, corn meal, cracked corn, white middlings, brown middlings, bran, cracked wheat, meat scraps, fish meal, ground groats, cut groats, milk, edible bone, salt, calcium carbonate, tested oil and alfalfa leaf meal.

**Merrimack Dairy Ration**

Dried brewers grain, gluten, cottonseed, soybean meal, oil meal, bran, middlings, ground oats, bone meal, salt, corn meal, calcium carbonate, distillers' dried grains.

**Merrimack Eureka Dairy Ration**

Oat feed, gluten meal, corn meal, cottonseed, bran, gluten feed, soybean oil meal, molasses, salt and calcium carbonate.

**Merrimack Growing Mash**

Soybean oil meal, corn meal, bran, red dog, brown middlings, ground groats, oats, alfalfa leaf meal, fish meal, milk, meat scraps, bone meal, calcium carbonate, salt and tested oil.

**Merrimack Laying Mash**

Soybean oil meal, corn meal, bran, red dog, brown middlings, ground groats, ground oats, fish meal, alfalfa leaf meal, milk, meat scraps, bone meal, calcium carbonate, salt and tested oil.

**Merrimack Milk Ration Sweetened**

Bran, middlings, gluten feed, gluten meal, linseed oil meal, soybean oil meal, cottonseed, ground oats, corn meal, dried brewers grains, molasses, bone meal, calcium carbonate, salt, distillers' grains.

**Merrimack Special Mash**

Soybean oil meal, brown middlings, corn meal, alfalfa leaf meal, bran, ground oats, meat scraps, fish meal, calcium carbonate, salt and tested oil.

**Merrimack Super Mash**

Soybean oil meal, corn meal, ground oat groats, white middlings, brown middlings, bran, meat scraps, fish meal, dry milk, edible bone meal, alfalfa leaf meal, salt, calcium carbonate and tested oil.

**Middlesex Farm Bureau Federation, Inc.****Farm Bureau Brand All Mash Laying**

Yellow corn meal, wheat bran, standard middlings, ground oats, skimmed milk, alfalfa leaf meal, meat scraps 50%, fish meal 58%, oyster shell meal, sardine oil and cod liver oil, salt.

**Farm Bureau Brand All Mash Developer**

Yellow corn meal, wheat bran, wheat flour middlings, ground oats, ground barley, alfalfa leaf meal, soy bean oil meal 41%, skimmed milk, meat scraps 50%, fish meal 58%, oyster shell meal, sardine oil and cod liver oil, salt.

**Farm Bureau Brand Dairy Ration 24%**

Corn meal, ground oats, wheat bran, corn distillers' grain, cottonseed meal 41%, soybean oil meal 41%, corn gluten feed, linseed oil meal, oyster shell meal, salt, cane molasses.

**Farm Bureau Brand Dairy Ration 16%**

Corn meal, ground oats, wheat bran, corn distillers' grain, cottonseed meal 41%, soybean oil meal 41%, corn gluten feed, linseed oil meal, ground barley, oyster shell meal, salt, cane molasses.

**Farm Bureau Brand Developer Mash**

Corn meal, ground oats, pulverized oats, wheat bran, soybean oil meal 41%, corn gluten meal, salt, alfalfa leaf meal, sardine oil, cod liver oil, standard middlings, flour middlings, meat scraps 50%, skimmed milk, oyster shell meal.

**Farm Bureau Brand Laying Mash 20%**

Corn meal, ground oats, wheat bran, soy bean oil meal 41%, salt, alfalfa leaf meal, sardine oil, cod liver oil, flour middlings, meat scraps 50%, fish meal 58%, skimmed milk, oyster shell flour.

**Farm Bureau Brand Laying Mash (without Milk)**

Corn meal, ground oats, wheat bran, soy bean meal 41%, corn gluten meal, salt, alfalfa leaf meal, sardine oil and cod liver oil, standard middlings, meat scraps 50%, fish meal 58%, ground barley, oyster shell meal.

**Farm Bureau Brand Laying Mash 17%**

Corn meal, ground oats, wheat bran, salt, alfalfa leaf meal, sardine oil and cod liver oil, flour middlings, meat scraps 50%, fish meal 58%, skimmed milk, oyster shell meal.

**Farm Bureau Brand Starter & Broiler**

Corn meal, pulverized oats, wheat bran, corn gluten meal, salt, alfalfa leaf meal, sardine oil, cod liver oil, standard middlings, meat scraps 50%, flour middlings, fish meal 58%, skimmed milk, ground oat groats, oyster shell meal.



## Geo. Q. Moon &amp; Co., Inc.

**Special A Dairy 20% Ration**

Corn gluten feed, corn distillers grains, rye distillers grains, cottonseed meal, o. p. linseed oil meal, wheat bran (with ground screenings not to exceed mill run), soybean oil meal, peanut oil meal, hominy feed, calcium carbonate, salt, molasses.

**Moon's 20% Dairy Feed with Molasses**

Alfalfa meal, cocoa bean residue meal, hominy feed, soybean oil meal, corn gluten feed, ground and bolted clipped oat by-product, rye distillers grains, corn distillers grains, o. p. linseed oil meal, cottonseed meal, wheat bran (with ground screenings not to exceed mill run), calcium carbonate, salt, molasses, ground oats, ground screenings from wheat, ground barley, peanut oil meal.

**Moon's Special A Laying Mash**

Hominy feed, corn meal, alfalfa meal, meat scrap, wheat bran and wheat middlings (with ground screenings not to exceed mill run), pulverized oats, fish meal, corn gluten feed, dried skim milk, dried buttermilk, calcium carbonate, salt, cod liver oil, ground barley, soybean oil meal, and V. D. (honey locust bean meal, aniseed, pure crushed flaxseed, dried albumen of milk, codfish residue meal, selected blood flour, cocoa, fennugreek seed, potassium iodide, cod liver oil, rice polish, wheat flour middlings, choice cottonseed meal, coconut oilcake meal, soybean oilcake meal, special steamed bone meal, linseed oilmeal, salt).

**U. S. 24% Dairy Ration**

Corn gluten feed, rye distillers grains, corn distillers grains, hominy feed, corn meal, soybean oil meal, peanut oil meal, alfalfa meal, o. p. linseed oil meal, cottonseed meal, alfalfa meal, wheat bran (with ground screenings not to exceed mill run), ground grain screenings, ground and bolted clipped oat by-product, cocoa bean residue meal, calcium carbonate, salt, molasses, ground barley.

**U. S. Drought Ration**

Corn gluten feed, rye distillers grains, corn distillers grains, soybean oil meal, cottonseed meal, peanut oil meal, alfalfa meal, ground and bolted clipped oat by-product, wheat bran (with ground screenings not to exceed mill run), cocoa bean residue meal, salt, calcium carbonate, steamed bone meal, molasses, ground barley, ground oats, ground screenings from wheat.

## Ogden Grain Co.

**Ograinco Milk Ration**

Corn distillers dried grains, corn gluten feed, soybean oil meal, cotton seed meal, corn meal or hominy, wheat bran, ground wheat screenings, cane molasses, salt, calcium carbonate, o. p. linseed oil meal.

**Pilgrim Growing Mash**

Alfalfa meal, dried skim milk, meat scraps, fish meal, wheat middlings, wheat bran, pulverized oats, corn meal, oyster shell meal, salt, cod liver oil.

**Pilgrim Special Laying Mash**

Alfalfa meal, pulverized oats, meat scraps, fish meal, soyabean oil meal, corn meal, ground wheat, wheat bran, wheat middlings (may contain mill run screenings), salt, oyster shell meal, cod liver oil, dried skimmilk.

**Pilgrim All Purpose Complete Ration**

Alfalfa meal, pulverized oats, meat scraps, dried skim milk, fish meal, corn meal, wheat middlings, wheat flour middlings (may contain screenings not exceeding mill run), bone meal, cod liver oil, calcium carbonate, Kelco meal.

**Pilgrim "Cackle" 20% Laying Mash**

Alfalfa meal, pulverized oats, meat scraps, fish meal, gluten meal, dried skim milk, corn meal, soyabean oil meal, wheat bran, wheat middlings, calcium carbonate, cod liver oil, salt, potassium iodide, "Vitadine".

**Pilgrim 16% Dairy Feed**

Corn gluten feed, hominy feed or corn meal, wheat bran, dried brewers grains, ground wheat screenings, cane molasses, calcium carbonate, salt.

**Pilgrim Laying Mash**

Alfalfa leaf meal, pulverized oats, meat scraps, fish meal, dried skim milk, semi-solid buttermilk, gluten meal, soyabean oil meal, corn meal, wheat bran, wheat middlings, calcium carbonate, cod liver oil.

**Thrift 20% Dairy Feed**

Soyabean oil meal, corn gluten feed, old process linseed oil meal, gluten meal, corn meal, low fibre ground oats, cotton seed meal, standard wheat bran, standard wheat middlings, ground wheat screenings, molasses, calcium carbonate, salt.

## Park &amp; Pollard Co.

**Bidwell 20% Dairy Ration**

Wheat bran, linseed oil meal, malt sprouts, gluten feed, ground oats, gluten meal, soybean oil meal, ground barley, cottonseed meal, ground grain screenings from wheat, oats, barley, buckwheat and milo, molasses, calcium carbonate and salt.

**Bidwell Laying Mash**

Dried buttermilk, alfalfa meal, corn meal, wheat bran (may contain mill run wheat screenings), wheat middlings, fish meal, meat, bone, linseed oil meal, corn gluten meal, soybean oil meal, calcium carbonate, salt and ground: wheat, oats, barley, kaffir corn and buckwheat, vitamin tested cod liver oil.

**Doublex 24% Dairy Ration**

Wheat bran, linseed oil meal, soybean oil meal, ground oats, malt sprouts, corn gluten meal cottonseed meal, corn gluten feed, ground grain screenings from wheat, oats, barley, buckwheat and milo, molasses, calcium carbonate and salt.

**Doublex 16% Dairy Ration**

Corn distillers grains, ground oats, ground barley, brewers dried grains, malt sprouts, linseed oil meal, cottonseed meal, ground grain screenings from wheat, oats, barley, buckwheat and milo, soybean oil meal, corn gluten feed, molasses, calcium carbonate and salt.

**Park & Pollard Growing Feed**

Dried buttermilk, alfalfa leaf meal, Iodol fish meal, linseed oil meal, meat and bone meal, wheat bran (may contain mill run wheat screenings), wheat middlings, corn gluten meal, calcium carbonate, salt, ground: corn, wheat, oats, barley and buckwheat, vitamin tested cod liver oil.

**Lay or Bust Dry-Mash**

Dried buttermilk, alfalfa leaf meal, corn gluten meal, Iodol fish meal, meat, bone, linseed oil meal, soybean oil meal, wheat bran (may contain mill run wheat screenings), wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley, kaffir corn and buckwheat, vitamin tested cod liver oil.

**Manamar Lay or Bust Dry-Mash**

Kelp, Pacific Coast fish meal and marine sea shells, dried buttermilk, alfalfa leaf meal, corn gluten meal, meat, bone, linseed oil meal, soybean oil meal, wheat bran (may contain mill run wheat screenings), wheat middlings, calcium carbonate, salt, ground: corn, wheat, oats, barley, kaffir corn and buckwheat, vitamin tested cod liver oil.

**George H. Parker Grain Co.****Parker's Egg Mash**

Yellow corn meal, wheat bran, wheat middlings, ground oats, dried skimmed milk, meat scraps, fish meal, alfalfa leaf meal, soya bean meal, edible bone meal, calcium carbonate, charcoal, vitamin tested cod liver oil and salt.

**Parker's Special Dairy Ration**

Wheat bran, yellow corn meal, hominy, old process linseed meal, soy bean meal, oat feed, corn gluten feed, cottonseed meal, molasses, calcium carbonate, steamed bone meal and salt.

**Phaneuf & Son****O-Boy Egg Mash**

Ground yellow meal and ground oats, fish meal, soybean oil meal, meat scraps, milk sugar feed or dried whey (feeding), corn gluten meal, standard wheat middlings, wheat bran, cocoanut oil meal, dried tomato pulp, crab meal, alfalfa leaf meal. Essential minerals — (calcium carbonate, calcium phosphate, calcium sulphate, iron sulphate, sulphur, iodine and salt), cod liver oil.

**W. N. Potter Grain Stores, Inc.****A.D.P. 24% Dairy Ration**

Ground corn, hominy, cottonseed meal, corn gluten meal, wheat bran, ground oats, oilmeal, calcium carbonate, bone meal and salt.

**Potter's Sweetened Dairy Ration**

Gluten feed, hominy, linseed oilmeal, ground oats, wheat bran, std. wheat middlings, cottonseed meal, corn distillers grains, molasses, calcium carbonate, bone meal and salt.

**H. C. Puffer Co.****Egg-Em-On Growing Feed**

Corn feed meal, corn gluten feed, ground barley, feeding oatmeal, soy bean meal, wheat bran, wheat middlings, meat scraps, fish meal, dried milk, alfalfa meal, cod liver oil, salt, calcium carbonate.

**Egg-Em-On Laying Mash**

Dried milk, dried fish, meat scraps, wheat bran and wheat middlings (not exceeding mill run of screenings), corn feed meal, corn gluten feed, feeding oatmeal, soy bean meal, linseed meal, alfalfa meal, cod liver oil, small percentage salt and calcium carbonate.

**Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, soy bean meal, ground oats, corn feed meal or hominy meal, wheat bran and wheat middlings (not exceeding mill run of screenings), small percentage salt and calcium carbonate.

**Sweetened Producer Dairy Feed**

Linseed oil meal, cotton seed meal, corn gluten feed, soy bean meal, corn feed meal or hominy meal, wheat bran (not exceeding mill run of screenings), oat feed, molasses, small percentage salt and calcium carbonate.

**Quaker Oats Co.****Big Egg Laying Mash**

Hominy feed, yellow hominy feed, wheat bran, wheat standard middlings, ground oats, fish meal, soybean oil meal, meat scraps, sardine oil, dried skimmed milk, molasses, alfalfa meal,  $\frac{1}{4}$  of 1% salt.

**Quaker 24% Protein Dairy Ration**

Hominy feed, yellow hominy feed, barley feed, cottonseed meal, corn gluten feed, soybean oil meal, wheat bran, wheat standard middlings, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% iodized ground limestone, 1% bone meal, molasses.

**Quaker 20% Protein Dairy Ration**

Hominy feed, yellow hominy feed, barley feed, cottonseed meal, corn gluten feed, soybean oil meal, wheat bran, wheat standard middlings, oat mill feed (Oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% iodized ground limestone, 1% bone meal, molasses.

**Quaker 16% Protein Dairy Ration**

Hominy feed, yellow hominy feed, barley feed, cottonseed meal, soybean oil meal, corn gluten feed, wheat bran, wheat standard middlings, ground oat screenings, oat mill feed (oat hulls, oat shorts, oat middlings),  $\frac{3}{4}$  of 1% salt, 1% iodized ground limestone, 1% bone meal, molasses.

**Quaker Ful-O-Pep Egg Mash**

Oatmeal, hominy feed, yellow hominy feed, wheat bran, wheat standard middlings, barley meal, fish meal, cod liver meal, meat scraps, sardine oil, dried skimmed milk, dried buttermilk, molasses, alfalfa meal,  $\frac{3}{4}$  of 1% salt.

**Ralston Purina Co.****Protena 24% Dairy Feed**

Linseed meal, soy bean oil meal, cottonseed meal, alfalfa meal, corn gluten feed, wheat middlings (standard), wheat bran, molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Protena 20% Dairy Feed**

Linseed meal, soy bean oil meal, cottonseed meal, corn gluten feed, wheat middlings (standard), alfalfa meal, wheat bran, ground grain screenings (from wheat, corn, oats, barley, kafir), molasses, 2% calcium carbonate (limestone), 1% iodized salt.

**Protena 16% Dairy Feed (Buffalo Mill)**

Linseed meal, soy bean oil meal, gluten feed, alfalfa meal, wheat middlings (standard), cottonseed meal, molasses, ground grain screenings (from wheat, corn, oats, barley, kafir), wheat bran, 2% calcium carbonate (limestone), 1% iodized salt.

**Protena Laying Mash**

Meat scrap, soy bean oil meal, linseed meal, corn meal, dried buttermilk, cod liver oil, sardine oil, alfalfa meal, wheat middlings (standard), wheat bran, 4% calcium carbonate (limestone), 1% salt.

**Purina Broiler Chow**

Pur-A-Tene (Carotene), cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, dried buttermilk, alfalfa leaf meal, corn meal, ground oats, wheat middlings, (standard), wheat bran, alfalfa meal,  $1\frac{1}{2}$ % calcium carbonate (limestone),  $\frac{1}{2}$ % iodized salt.

**Purina Chick Growena**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, wheat germ, alfalfa meal, corn meal, beet pulp, grey wheat middlings, wheat bran,  $1\frac{1}{2}$ % calcium carbonate (limestone),  $\frac{1}{2}$ % iodized salt.

**Purina Chick Startena**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, alfalfa leaf meal, wheat germ, linseed meal, corn germ meal, oat middlings, corn meal, wheat bran, grey wheat middlings,  $1\frac{1}{2}$ % calcium carbonate (limestone),  $\frac{1}{2}$ % iodized salt.

**Purina Chicken Fatena**

Ground oats, corn meal, ground barley, corn germ meal, wheat flour (second clear), grey wheat middlings, soy bean oil meal, meat scrap, rolled oats,  $\frac{1}{2}$ % iodized salt.

**Purina Chicken Fatena Checkers**

Dried skim milk, ground oats, corn meal, ground barley, meat scrap, soy bean oil meal, wheat middlings (grey), molasses,  $\frac{1}{2}$ % iodized salt.

**Purina Egg Chowder**

Pur-A-Tene (Carotene), cod liver oil, sardine oil, meat scrap, soy bean oil meal, linseed meal, alfalfa meal, corn germ meal, dried buttermilk, wheat middlings (standard), wheat bran, corn meal, 1% iodized salt, 3% calcium carbonate (limestone).

**Purina Growing Chow**

Pur-A-Tene (Carotene), cod liver oil, sardine oil, meat scrap, fish meal, soy bean oil meal, wheat germ, dried buttermilk, corn germ meal, grey wheat middlings, wheat bran, alfalfa meal, corn meal, 3% calcium carbonate (limestone), 1% iodized salt.

**Purina Lay Chow**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, soy bean oil meal, linseed meal, alfalfa meal, corn germ meal, wheat middlings (standard), wheat bran, corn meal, 1% iodized salt, 3% calcium carbonate (limestone).

**Purina Layena (Complete Ration)**

Pur-A-Tene (Carotene), dried buttermilk, cod liver oil, sardine oil, meat scrap, soy bean oil meal, alfalfa meal, wheat middlings (standard), beet pulp, corn meal,  $\frac{1}{2}$ % iodized salt, 4% calcium carbonate (limestone).

**Purina Milking Cow Chow (24%)**

Linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, distillers' corn dried grains, brewers' dried grains, wheat middlings (standard), wheat bran, alfalfa meal, molasses, 2% calcium carbonate (limestone), 1% iodized salt.



**Purina Milking Cow Chow (20%)**

Dried beet pulp, linseed meal, soy bean oil meal, corn gluten feed, cottonseed meal, distillers' corn dried grains, brewers' dried grains, wheat middlings (standard), wheat bran, corn meal, alfalfa meal, molasses, 2 % calcium carbonate (limestone), 1 % iodized salt.

**Purina Milking Cow Chow (16%)**

Linseed meal, soy bean oil meal, corn gluten feed, crushed oats, ground barley, cottonseed meal, distillers' corn dried grains, brewers' dried grains, wheat middlings (standard), wheat bran, corn meal, alfalfa meal, dried beet pulp, molasses, 2 % calcium carbonate (limestone), 1 % iodized salt.

D. F. Riley

**Riley's Chick & Broiler Ration**

Corn meal, wheat bran, flour middlings, dried skim milk, beef scraps, oil meal, feeding oat meal, ground limestone, alfalfa leaf meal, salt, XX cod liver oil.

**Riley's 20 % Dairy Ration**

Gluten feed, wheat middlings, linseed oil, 41 % cottonseed meal, wheat bran, dried brewer grains, corn meal or hominy, bone meal, salt.

**Riley's Laying Mash**

Wheat middlings, wheat bran, yellow corn meal, gluten feed, ground oats, beef scraps, fish meal, dried skim milk, o. p. oil meal, alfalfa leaf meal, calcium carbonate, salt, fortified cod liver oil.

Ryther & Warren

**Blue Tag Dairy Ration**

41 % cottonseed meal, old process linseed oil meal, corn gluten feed, hominy feed (or corn meal), pure wheat bran, wheat middlings, ground oats, corn distillers grains, dried beet pulp, calcium carbonate and salt.

**Minot Complete Laying Mash**

Corn meal, pure wheat bran, wheat middlings, ground oats, alfalfa leaf meal, meat scraps, fish meal, dried milk, cod liver meal, shell meal and salt.

**Minot Milk Egg Mash**

Corn meal, pure bran, flour middlings, ground oats, meat scraps 50 % pro., fish meal, 55 % pro., alfalfa leaf meal, powdered milk, corn gluten meal, shell flour, salt and fortified cod liver oil.

**Minot Special Dairy Ration**

Wheat bran, ground oats, gluten feed, cottonseed meal (41 per cent), soy bean meal, hominy feed or corn meal, corn distillers grains, dried brewers grains, calcium carbonate and salt.

**Minot Poultry Mash**

Wheat bran, wheat middlings, red dog middlings, corn meal, gluten feed, alfalfa meal, ground oats, meat scraps, fish meal and salt.

St. Albans Grain Co.

**Hygrade 20 Milk Ration**

Old process linseed meal, soybean oil meal, cottonseed meal, brewers' dried grains, corn gluten meal, corn gluten feed, corn meal, hominy feed, ground oats, ground barley, wheat bran, wheat middlings, cane molasses, calcium carbonate and dairy salt.

**Hygrade 24 Milk Ration**

Corn gluten meal, corn gluten feed, old process linseed meal, soybean oil meal, cottonseed meal, brewers' dried grains, corn meal, hominy feed, ground oats, ground barley, wheat bran, wheat middlings, calcium carbonate, dairy salt and cane molasses.

**Utility 20 Dairy Ration**

Old process linseed meal, soybean oil meal, corn gluten feed, cottonseed meal, corn meal, hominy feed, ground oats, ground barley, brewers' dried grains, oat meal mill by-products, (oat middlings, oat shorts, oat hulls), wheat bran, wheat middlings, calcium carbonate, cane molasses and dairy salt.

**Utility 16 Dairy Ration**

Old process linseed meal, corn gluten meal, corn gluten feed, cottonseed meal, yellow corn meal, hominy feed, ground oats, ground barley, brewers' dried grains, oat meal mill by-products (oat middlings, oat shorts, oat hulls), wheat bran, wheat middlings, calcium carbonate, cane molasses and dairy salt.

**Wirthmore Baby Chick Starter**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), alfalfa leaf meal, fish meal, meat scraps, corn gluten meal, soybean oil meal, pure wheat bran, pure wheat middlings, ground oat groats, ground wheat, yellow corn meal, calcium carbonate and salt.

**Wirthmore 25 Balanced Ration**

Corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, ground barley, ground oats, cottonseed meal, corn gluten feed, yellow corn meal, wheat middlings, wheat bran, edible bone meal, cane molasses and dairy salt.

**Wirthmore Breeder Mash**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), liver meal, meat scraps, fish meal, yellow corn meal, alfalfa leaf meal, soybean oil meal, corn gluten meal, wheat bran, wheat middlings, pulverized oats and barley, calcium carbonate and salt.

**Wirthmore Complete Chick Starter & Broiler Ration**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), ground oat groats, meat scraps, fish meal, alfalfa leaf meal, corn gluten meal, soybean oil meal, yellow corn meal, wheat bran, wheat middlings, calcium carbonate and salt.

**Wirthmore Complete Growing Ration**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, soybean oil meal, corn gluten meal, ground yellow corn, ground wheat, ground oats, ground barley, wheat bran, wheat middlings, alfalfa leaf meal, calcium carbonate and salt.

**Wirthmore Complete Laying Ration**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), liver meal, meat scraps, fish meal, whole oat groats, ground yellow corn, ground oats, alfalfa leaf meal, ground wheat, wheat bran, wheat middlings, calcium carbonate and salt.

**Wirthmore 20 Dairy Ration**

Fortified cod liver oil, corn gluten meal, corn distillers' dried grains, old process linseed meal, soybean oil meal, cottonseed meal, corn gluten feed, yellow corn meal, ground oats, ground barley, wheat middlings, wheat bran, edible bone meal, cane molasses and dairy salt.

**Wirthmore Dairy Feed with Beet Pulp**

Dried beet pulp, cottonseed meal, old process linseed meal, soybean oil meal, wheat bran, wheat middlings, corn gluten feed, yellow corn meal, ground oats, edible bone meal, cane molasses and dairy salt.

**Wirthmore 16 Dairy Ration**

Fortified cod liver oil, corn gluten meal, corn distillers' dried grains, corn gluten feed, old process linseed meal, soybean oil meal, yellow corn meal, hominy feed, ground oats, ground barley, wheat bran, wheat middlings, cottonseed meal, calcium carbonate, cane molasses, steamed bone meal and dairy salt.

**Wirthmore Duck Breeder's Laying Ration**

Yellow corn meal, wheat bran, wheat middlings, wheat flour, ground oat groats, meat scraps, fish meal, alfalfa leaf meal, calcium carbonate and salt.

**Wirthmore Fleshing Pellets**

Dried skim milk, meat scraps, soybean oil meal, corn germ meal, feeding oat meal, wheat bran, wheat middlings, wheat red dog flour, yellow corn meal, alfalfa meal, calcium carbonate, salt, cod liver oil, molasses.

**Wirthmore Laying Mash**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, yellow corn meal, alfalfa meal, soybean oil meal, corn gluten meal, wheat bran, wheat middlings, ground wheat, oats, barley, buckwheat, calcium carbonate and salt.

**Wirthmore Laying Pellets**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), soybean oil meal, fish meal, meat scraps, feeding oatmeal, yellow corn meal, pulverized oats, ground wheat, wheat bran, wheat standard middlings, wheat flour middlings, alfalfa leaf meal, calcium carbonate and salt.

**Wirthmore Turkey Fattening Ration**

Dried skim milk, dried whey (milk sugar feed), meat scraps, corn gluten meal, alfalfa meal, yellow corn meal, fine ground oats, barley, wheat, wheat bran, wheat middlings, wheat flour middlings and salt.

**Wirthmore Turkey Growing Ration**

Cod liver oil, dried skim milk, dried whey (milk sugar feed), meat scraps, fish meal, soybean oil meal, corn gluten meal, alfalfa meal, yellow corn meal, fine ground oats, barley, wheat, wheat bran, wheat middlings, wheat flour middlings, calcium carbonate and salt.

**Squier & Co.****Squiers Buttermilk Egg Mash**

Dried buttermilk, meat scrap, fish meal, bone meal, corn gluten feed, alfalfa meal, wheat bran, wheat middlings, corn meal, ground oats, soybean oil meal, calcium phosphate and salt.

**C. H. Symmes & Co.****The Ideal Dairy Ration**

Wheat middlings, wheat bran, brewers grains, cottonseed meal, linseed meal, gluten meal, gluten feed, corn meal or white hominy, molasses, salt, bone meal, calcium carbonate, ground barley.

**Tioga Mills, Inc.****E-Gee 20% Dairy Feed**

Wheat bran, peanut oil meal, corn gluten feed, wheat middlings, cane molasses, cottonseed meal, salt, phosphate of lime, charcoal, potassium iodide, corn distillers grains, palm kernel oil meal, ground barley, malt sprouts. (Wheat bran and wheat middlings may contain ground screenings not exceeding mill run).

**United Cooperative Farmers, Inc.****United Farmers Growing Mash**

Coarse No. 2 yellow corn meal, wheat bran, wheat flour midds, pulverized 38 lb. white oats, meat scraps 50%, fish meal 55%, dried skim milk, alfalfa leaf meal, oyster shell flour, high grade cod liver oil, salt.

**United Farmers Milk Egg Mash**

No. 2 yellow meal — Attrition, standard wheat bran, wheat flour midds, pure pulverized oats (No. 2-38 lb. clipped-unsul.), meat scraps 50%, alfalfa leaf meal, dried buttermilk, oyster shell meal, high grade cod liver oil, salt, fish meal 55%.

**United Farmers Milkmaker**

Choice yellow hominy, 38 lb. ground oats, standard or pure bran, choice cottonseed 41%, oil meal pure, corn gluten feed, soya bean meal, molasses, corn distillers' grains, steamed bone meal, calcium carbonate, salt.

**United Farmers Milk Pep**

Cottonseed 41%, o. p. oil meal, yellow hominy, corn gluten feed, pure ground oats 38 lb., soybean meal, standard or pure bran, cane molasses, corn distillers' grains, bone meal, calcium carbonate, salt.

**United Farmers Starting & Growing Mash**

No. 2 yellow corn meal (attrition), wheat flour middlings, standard wheat bran, ground oats pulverized, pure dried buttermilk, alfalfa leaf meal, pure fish meal 55%, meat scraps 50%, oyster shell flour, salt, high grade cod liver oil.

**Unity Feeds, Inc.****Paycheck 24% Dairy Ration**

Distillers dried grains, corn gluten feed, soya bean oil meal, ground corn, ground oats, wheat and bran processed, cottonseed meal, palm kernel meal, molasses, calcium carbonate and salt.

**Paycheck 20% Dairy Ration**

Distillers dried grains, corn gluten feed, soya bean oil meal, wheat and wheat bran processed, cottonseed meal, palm kernel meal, ground corn, ground oats, molasses, calcium carbonate and salt.

**Unity Complete Starting and Broiler Mash**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, fish meal, meat scraps, ground wheat, ground barley, corn meal, ground oats, wheat bran, wheat middlings, calcium carbonate and salt.

**Unity Growing Mash**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, soya bean meal, fish meal, meat scraps, linseed oil meal, wheat bran, wheat middlings, ground oats, ground wheat, corn meal, calcium carbonate and salt.

**Unity Laying Mash**

Dried buttermilk, vitamin tested cod liver oil, alfalfa leaf meal, soya bean meal, fish meal, meat scraps, linseed oil meal, wheat bran, wheat middlings, ground oats, ground wheat, corn meal, calcium carbonate and salt.

**C. P. Washburn Co.****"Made Right" Balanced Ration**

Cottonseed meal, linseed oil meal, corn gluten, wheat bran, corn meal, oat feed, beet pulp, charcoal, calcium carbonate, salt, bone meal, ground oats, soya bean meal, brewers grain.

**"Made Right" Complete Broiler Ration**

Fortified cod liver oil, dried milk, corn meal, bran, middlings, oat meal, high grade meat scraps, fish meal, ground wheat, soya bean meal, gluten, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, minerals, iron oxide, iodine.

**"Made Right" Complete Layer**

Fortified cod liver oil, dried milk, corn meal, bran, middlings, oat meal, high grade meat scraps, fish meal, ground wheat, soya bean meal, gluten, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, minerals, iron oxide, iodine.

**"Made Right" Sweet Dairy Feed**

Corn meal, wheat meal, ground oats, cottonseed meal, linseed oil meal, wheat bran, soya bean meal, gluten, molasses, bone meal, calcium carbonate, salt, brewers grain.

**"Made Right" 16% Dairy Feed**

Corn meal, wheat meal, ground oats, cottonseed meal, wheat bran, soya bean meal, gluten, molasses, bone meal, calcium carbonate, salt, brewers grain.

**"Made Right" Dry Mash**

Corn meal, wheat bran, wheat middlings, red dog, 2nd clear flour, ground oat meal, linseed oil meal, gluten feed, soya bean meal, ground wheat, meat scraps, fish meal, dried milk, alfalfa leaf meal, molasses, charcoal, calcium carbonate, salt, cod liver oil, calcium phosphate, minerals iron oxide, iodine.

**"Made Right" Starting & Growing Feed**

Corn meal, wheat bran, wheat middlings, oat meal, gluten meal, red dog, 2nd clear flour, meat scraps, ground wheat, soya bean meal, fish meal, dried milk, alfalfa leaf meal, molasses, calcium carbonate, charcoal, salt, cod liver oil, calcium phosphate, minerals, iron oxide, iodine.

**Wayne County Grangers Feed Corp.****Clyde 20% Dairy Feed**

Corn distillers grains, corn gluten feed, ground oats, brewers grains, hominy feed or corn meal, cottonseed meal, wheat bran (may contain screenings), malt sprouts, soybean oil meal, cane molasses, ground limestone, salt, steamed bonemeal.

**H. K. Webster Co.****Blue Seal Beet Pulp Dairy Ration**

Beet pulp, soy bean oil meal, gluten meal, malt sprouts, wheat bran, oat feed, choice cottonseed meal, peanut skins, germs and meal, hominy feed, brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bonemeal, calcium carbonate, dicalcium phosphate, potassium iodide, and salt).

**Blue Seal Breeders' Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, ground fancy wheat, fine ground heavy oats, ground rolled oats, ground barley, corn gluten meal, 50% meat scraps, dried skim milk, 55% codfish meal, alfalfa leaf meal, salt, calcium carbonate, cod liver oil.

**Blue Seal Chick Builder**

High grade meat scraps, dried skim milk, alfalfa leaf meal, corn gluten meal, yellow corn meal pure wheat bran, pure wheat middlings, fine ground oats, P. R. cane molasses, calcium carbonate, salt, cod liver oil.

**Blue Seal Chick Starter**

Coarse ground No. 2 yellow corn, fine ground heavy oats, ground barley, corn gluten meal, pure wheat bran, wheat flour middlings, 60% meat scraps, 65% fish meal vacuum process, dried skim milk, alfalfa leaf meal, calcium carbonate, salt, cod liver oil.

**Blue Seal College Mash**

No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, fine ground heavy oats, 50% meat scraps, 55% codfish meal, alfalfa leaf meal, dried skim milk, calcium carbonate, salt, with cod liver oil added.

**Blue Seal "Sixteen" Dairy Ration**

Fancy crushed oats, ground oats, linseed oil meal (pea sized), soy bean oil meal (pea sized), ground barley, hominy feed, wheat bran, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, potassium iodide, and salt).

**Blue Seal "20" Dairy Ration**

Old process linseed oil meal, soy bean oil meal, ground oats, malt sprouts, corn oil meal, gluten feed, choice cottonseed meal, hominy feed, wheat bran, corn distillers' grains, dried brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, potassium iodide and salt).

**Blue Seal Egg Mash**

Yellow corn meal, fine ground heavy oats, pure wheat bran, pure wheat middlings, meat scraps, dried skim milk, alfalfa leaf meal, P. R. cane molasses, gluten meal, calcium carbonate, salt, cod liver oil.

**Blue Seal Growing Mash**

Dried skim milk, meat scraps, 55% codfish meal, alfalfa leaf meal, corn gluten meal, No. 2 yellow corn meal, pure wheat bran, wheat flour middlings, fine ground heavy oats, ground barley, P. R. cane molasses, calcium carbonate, salt, cod liver oil.

**Blue Seal Hom-Mix 24% Dairy Ration**

Choice cottonseed meal, soy bean oil meal, malt sprouts, corn oil meal, corn gluten meal, oat feed, wheat bran, hominy feed, peanut skins, germs and meal, linseed oil meal, dried brewers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate and salt).

**Blue Seal Improved All-Mash Ration**

Coarse ground No. 2 yellow corn, ground fancy wheat, fine ground heavy oats, pure wheat bran, wheat flour middlings, meat scraps, 55% codfish meal, dried skim milk, alfalfa leaf meal, P. R. cane molasses, calcium carbonate, salt, cod liver oil.

**Blue Seal Improved Balanced Ration**

Old process linseed oil meal, soy bean oil meal, ground oats, malt sprouts, corn gluten meal, choice cottonseed meal, hominy feed, wheat bran, corn distillers' grains, dried brewers' grains, corn oil meal, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, potassium iodide and salt).

**Blue Seal Laying Mash**

No. 2 yellow corn meal, pure wheat bran, fine ground heavy oats, meat scraps, corn gluten meal, wheat flour middlings, ground barley, ground fancy wheat, P. R. cane molasses, alfalfa leaf meal, dried skim milk, 55% codfish meal, salt, calcium carbonate, cod liver oil.

**Blue Seal Special 20% Dairy Ration**

Choice cottonseed meal, soy bean oil meal, corn oil meal, malt sprouts, gluten feed, oat feed, wheat bran, hominy feed, peanut skins, germs and meal, linseed oil meal, dried brewers' grains, corn distillers' grains, P. R. cane molasses, B. S. mineral mixture (white fish meal, edible bone meal, calcium carbonate, dicalcium phosphate, potassium iodide and salt).

Est. M. G. Williams

**Williams' Balanced Ration**

Corn meal or hominy, linseed oil meal, cotton seed meal, ground oats, gluten feed, dried brewers' grains, wheat feed, soy bean meal, calcium carbonate and 1% salt.

**Williams' Growing Feed**

Corn meal, bran, soy bean meal, feeding oatmeal, dried skim milk, leaf meal, fish meal, meat scraps, calcium carbonate, salt and cod liver oil.

**Williams' Laying Mash**

Corn meal, bran, middlings, ground oats, meat scraps, fish meal, leaf meal, dried skim milk, calcium carbonate, salt and cod liver oil.

Stanley Wood Grain Co.

**Bliss Dairy Ration**

Corn meal (or hominy), cottonseed meal, wheat bran, soybean meal, linseed meal, wheat middlings, gluten meal, gluten feed, table salt, edible bonemeal, calcium carbonate, (beet pulp).

**Preferred Startling & Growing Feed**

Pure dried skim milk, dried fish meal, yellow corn meal, wheat bran, wheat middlings, fine ground oatmeal, alfalfa leaf meal, beef scraps, edible bonemeal, table salt, calcium carbonate.

**Woods Dairy Ration**

Cottonseed meal, wheat middlings, yellow corn meal (or hominy), soybean meal, ground oats, old process linseed oil meal, corn gluten feed, dried beet pulp, wheat bran, salt, calcium carbonate.

**Average Analyses of Unmixed By-Products**  
(Collected between September 1, 1936 and April 1, 1937)

	Num- ber of Samples	Water (Per- cent)	Protein (Per- cent)	Fat (Per- cent)	Nitro- gen Free Extract (Per- cent)	Fiber (Per- cent)	Ash (Per- cent)
Cottonseed Meal . . .	41	8.3	40.5	6.0	29.0	10.3	5.9
Linseed Meal . . .	18	9.1	35.4	6.1	36.4	7.1	5.9
Soy Bean Oil Meal . . .	21	9.3	42.1	5.2	31.8	5.2	6.4
Gluten Meal . . .	13	10.3	44.5	2.5	39.4	1.9	1.4
Gluten Feed . . .	31	12.0	26.5	2.4	45.9	6.4	6.8
Distillers Dried Grains . .	18	8.2	29.3	8.7	40.2	11.1	2.5
Brewers Dried Grains . .	17	8.3	26.4	6.3	41.0	14.0	4.0
Wheat Standard Middlings .	15	12.3	18.0	5.0	53.5	6.9	4.3
Wheat Flour Middlings . .	10	12.1	17.3	5.0	56.8	5.0	3.8
Red Dog Flour . . .	11	12.2	18.6	3.9	59.9	2.7	2.7
Wheat Mixed Feed . . .	39	12.4	16.9	4.4	55.7	6.2	4.4
Wheat Bran . . .	51	13.4	16.2	4.7	51.7	8.6	5.4
Rye Feed . . .	1	11.1	15.8	2.9	63.2	3.7	3.3
Corn Meal . . .	30	13.8	9.8	5.1	68.0	1.7	1.6
Ground Oats . . .	51	10.7	12.7	4.2	58.7	10.2	3.5
Hominy Feed . . .	23	11.1	11.0	6.6	64.7	4.0	2.6
Dried Beet Pulp . . .	8	11.3	9.8	0.6	56.2	18.9	3.2
Oat Feed . . .	6	7.7	5.6	1.9	51.4	27.2	6.2

## Directory of Manufacturers Who Registered Feeding Stuff for Sale in Massachusetts in 1937

Albers Bros. Milling Co., Seattle, Wash.  
 E. T. Allen Co., Atlanta, Ga.  
 Allied Mills, Inc., Chicago, Ill.  
 American Distilling Co., Pekin, Ill.  
 American Maize-Products Co., 100 East 42nd St., New York, N. Y.  
 A. P. Ames Co., Peabody, Mass.  
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.  
 Archer-Daniels-Midland Co., Minneapolis, Minn.  
 Ashcraft-Wilkinson Co., Trust Company of Georgia Bldg., Atlanta, Ga.  
 W. E. Atkinson Co., 27 Water St., Newburyport, Mass.  
 Atlantic Coast Fish By-Products Co., Phoenix Ave., Lowell, Mass. (Registered by Great Eastern Feed Mills)  
 B. & B. Dairy Co., Inc., Margaretville, N. Y.  
 E. W. Bailey & Co., Montpelier, Vt.  
 Barber & Bennett, Inc., Albany, N. Y.  
 Beacon Milling Co., Inc., Cayuga, N. Y.  
 Berkshire Coal & Grain Co., North Adams, Mass.  
 Bisbee Linseed Co., Inc., Amsterdam, N. Y.  
 Blatchford Calf Meal Co., Waukegan, Ill.  
 Borden Grain Co., 26 Granite St., Taunton, Mass.  
 C. W. Brister & Son, Auburn, N. Y.  
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Company of North America)  
 Geo. B. Brown Corp., Ipswich, Mass.  
 C. W. Burckhalter, Inc., 177 Franklin St., New York, N. Y.  
 Burrus Mill & Elevator Co., Forth Worth, Texas.  
 Butman Feed Co., Lynn, Mass.  
 Camilla Cotton Oil Co., Camilla, Ga.  
 Canada Atlantic Grain Export Co., Inc., Produce Exchange, New York, N. Y.  
 Canada Linseed Oil Mills, Ltd., Montreal, Canada.  
 A. B. Caple Co., Sta. A., Box 27, Toledo, Ohio.  
 Center Milk Products Co., Middlebury Center, Penn.  
 Central Soya Co., Inc., Decatur, Ind.  
 Checkerboard Feed Store, Oswego, N. Y.  
 Clinton Co., Clinton, Iowa.  
 Coatsworth and Cooper, 67 Yonge St., Toronto, Canada.  
 Collis Products Co., 201 Custer St., St. Paul, Minn.  
 Commander-Larabee Milling Co., Minneapolis, Minn.  
 Community Feed Stores, Inc., South Deerfield, Mass.  
 Consolidated Chemical Industries, Inc., Woburn, Mass.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Continental Distilling Corp., 260 South Broad St., Philadelphia, Penn.  
 Copeland Flour Mills, Ltd., Midland, Ontario, Canada.  
 Corn Products Refining Co., 17 Battery Place, New York, N. Y.  
 Nicolas Courcy Grain Co., 12 Waverly St., Taunton, Mass.  
 Cover & Palm Co., 150 Middle St., Lowell, Mass.  
 Chas. M. Cox Co., Boston, Mass. (Registered for Sherwin-Williams Co., of Canada, Ltd.)  
 Curley Brothers, Main St., Wakefield, Mass.  
 Cutler Co., North Wilbraham, Mass. (Registered by St. Albans Grain Co.)  
 Dairymen's League Co-operative Association, Inc., 11 West 42nd St., New York, N. Y.  
 Dawe's Products Co., Chicago, Ill.  
 Decatur Milling Co., Inc., Decatur, Ill.  
 Dehydrating Process Co., Boston, Mass.  
 Delaware Mills, Inc., Deposit, N. Y. (Registered also for Squier & Co.)  
 Denver Alfalfa Milling & Products Co., Lamar, Col.  
 Dewey Bros. Co., Blanchester, Ohio.  
 Frank Diauto, 87 Warren St., Randolph, Mass.  
 F. Diehl & Son, Inc., Wellesley, Mass.  
 Dietrich & Gambrell, Inc., Frederick, Md.  
 Eagle Roller Mill Co., New Ulm, Minn.  
 East Bridgewater Farmers' Exchange, East Bridgewater, Mass.  
 Eastern Grain Co., Bridgewater, Mass.  
 Eastern States Farmers' Exchange, Box 1482, Springfield, Mass.  
 Economy Grocery Stores Corp., 393 D St., Boston, Mass.  
 Michael W. Ellis, 19 Walnut St., Peabody, Mass.  
 Ellison Coal and Grain Co., 15 Middlesex St., Haverhill, Mass.  
 Elmore Milling Co., Inc., Oneonta, N. Y.  
 John W. Eshelman & Sons, Lancaster, Penn.  
 Evans Milling Co., Inc., Indianapolis, Ind.  
 Excelsior Milling Co., Minneapolis, Minn.  
 Fairmont Creamery Co., Omaha, Neb.  
 Fant Milling Co., Sherman, Texas.  
 Farm Service Stores, Inc., Fitchburg, Mass.  
 Farmers Feed Co., 532 East 76th St., New York, N. Y.  
 Farmers Service Bureau, Baltimore, Md.  
 Federal Mill, Inc., Lockport, N. Y.  
 Fernando Valley Milling & Supply Co., Van Nuys, Cal.  
 Ferneau Grain Co., Blanchester, Ohio.  
 Finger Lakes and Hudson Flour Mills, Inc., Geneva, N. Y.  
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.  
 Flory Milling Co., Inc., Bangor, Penn.  
 Fred A. Fountain, 355 Tremont St., Taunton, Mass.  
 Dean S. French, 17 Columbia St., Stoughton, Mass.  
 Paul Fuller & Sons, 8 Mooney Ave., Salem, Mass.  
 Funk Bros. Seed Co., Bloomington, Ill.  
 J. B. Garland & Son, 15 Grafton St., Worcester, Mass.



General Foods Corp., Battle Creek, Mich.  
 General Mills, Inc., Chamber of Commerce Bldg., Minneapolis, Minn.  
 Georgia Distributing Co., Atlanta, Ga.  
 Gerard Milk Products Co., Philadelphia, Penn.  
 W. K. Gilmore & Sons, Inc., Walpole, Mass.  
 Glenmore Distilleries Co., Inc., Owensboro, Ky.  
 Gold Medal Farms, Inc., 1157 East 156th St., New York, N. Y.  
 Golden Eagle Milling Co., Petaluma, Cal. (Distributors for Western Condensing Co.)  
 Goode Grain Co., 452 Broadway, Lowell, Mass.  
 Grand Isle County Co-operative Creamery Assn., Inc., Grand Isle, Vt.  
 Grand Union Stores, Inc., 233 Broadway, New York, N. Y.  
 D. H. Grandin Milling Co., Jamestown, N. Y.  
 Great Atlantic & Pacific Tea Co., New York, N. Y.  
 Great Eastern Feed Mills, Phoenix Ave., Lowell, Mass. (Registered for Atlantic Coast Fish By-Products Co. and Wilmington Packing Co.)  
 Green Acre Farms, Nazareth, Penn.  
 Griesedieck Western Brewery Co., Belleville, Ill.  
 Gwinn Milling Co., Columbus, Ohio.  
 Hales & Hunter Co., 166 West Jackson Blvd., Chicago, Ill.  
 Frank B. Ham & Co., Ltd., 1707 Royal Bank Bldg., Toronto, Ontario, Canada.  
 Wm. Hamilton & Son, Inc., Caledonia, N. Y.  
 William Hamilton & Son, Inc., Honeoye Falls, N. Y.  
 D. Harbeck, 405 Earl St., New Bedford, Mass.  
 Hecker-H-O Division of Hecker Products Corp., Buffalo, N. Y.  
 Hecker-Jones-Jewell Milling Division of Standard Milling Co., 503 Seneca St., Buffalo, N. Y.  
 W. D. Higgins Co., Framingham, Mass.  
 D. B. Hodgkins' Sons, Gloucester, Mass.  
 Horvitz Grain Co., 742 Acushnet Ave., New Bedford, Mass.  
 Houston Milling Co., Houston, Texas.  
 Hubinger Co., Keokuk, Iowa.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 Illinois Cereal Mills, Inc., Paris, Ill.  
 Independent Tallow Co., Inc., 39 Cedar St., Woburn, Mass.  
 International Milling Co., Flour Exchange, Minneapolis, Minn.  
 Jaquith & Co., 305 Main St., Woburn, Mass.  
 Joslin-Schmidt Corp., Lockland Sta., Cincinnati, Ohio.  
 Kansas City Mills, Kansas City, Mo.  
 Kansas Flour Mills Corp., Kansas City, Mo.  
 Kasco Mills, Inc., Waverly, N. Y.  
 Kellogg Co., Battle Creek, Mich.  
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo, N. Y.  
 Keystone Dairy Co., 150 Nassau St., New York, N. Y.  
 H. H. King Flour Mills Co., Minneapolis, Minn.  
 Kraft-Phenix Cheese Corp., 400 Rush St., Chicago, Ill.  
 Chas. A. Krause Milling Co., Milwaukee, Wis.  
 Lake of the Woods Milling Co., Ltd., Montreal, Canada.  
 Larrowe Milling Co., Box 68, North End Sta., Detroit, Mich.  
 Franklin L. Lewi, Inc., 2 Broadway, New York, N. Y.  
 Lincoln Farm Products Corp., 407 East Thirty-First St., New York, N. Y.  
 L. B. Lovitt & Co., Memphis, Tenn.  
 A. S. MacDonald Commission Co., 404 Grain & Flour Exchange, Boston, Mass. (Registered for Parrish & Heimbecker, Ltd.)  
 Maine Fish Meal Co., Portland, Maine.  
 Mansfield Coal & Grain Co., Mansfield, Mass.  
 Mansfield Milling Co., 1 Samoset Ave., Mansfield, Mass.  
 Maple Leaf Milling Co., Ltd., Toronto, Ontario, Canada.  
 Maritime Milling Co., Inc., Buffalo, N. Y.  
 Meadow Brook Farms, 15 Mauch Chunk St., Nazareth, Penn.  
 Mellin's Food Company of North America, 41 Central Wharf, Boston, Mass. (Registered for A. H. Brown & Bros.)  
 Merrimack Farmers' Exchange, Inc., Concord, N. H.  
 Middlesex Farm Bureau Federation, Inc., 131 Lexington St., Waltham, Mass.  
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.  
 Mitsui & Co., Ltd., 350 Fifth Ave., New York, N. Y.  
 Montana Flour Mills Co., Great Falls, Mont.  
 Monti-Van Iderstine, Inc., 272 Hudson Ave., Brooklyn, N. Y.  
 Geo. Q. Moon & Co., Inc., Binghamton, N. Y.  
 Jas. F. Morse & Co., 11 Horace St., Somerville, Mass.  
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.  
 Neumond Co., 309 Merchants Exchange, St. Louis, Mo.  
 New England Dairies, Inc., 51 Cornhill, Boston, Mass.  
 New England Rendering Co., Brighton, Mass.  
 New England Retail Grain Dealers Cooperative Association, Inc., Springfield, Mass.  
 Norris Grain Co., 1640 Board of Trade Bldg., Chicago, Ill.  
 Northwestern Consolidated Milling Division of Standard Milling Co., Minneapolis, Minn.  
 Ogden Grain Co., Utica, N. Y.  
 Ogilvie Flour Mills Co., Ltd., P. O. Box 2080, Montreal, Canada.  
 Philip R. Park, Inc., San Pedro, Cal.  
 Park & Pollard Co., 356 Hertel Ave., Buffalo, N. Y.  
 Geo. H. Parker Grain Co., Danvers, Mass.  
 Parrish & Heimbecker, Ltd., Toronto, Ontario, Canada. (Registered by A. S. MacDonald Commission Co.)  
 Patent Cereals Co., Geneva, N. Y.  
 Pecos Valley Alfalfa Mill Co., Hagerman, N. M.  
 Penick & Ford Ltd., Inc., Cedar Rapids, Iowa.  
 Phaneuf & Son, 188 Rivet St., New Bedford, Mass.  
 Pillsbury Flour Mills Co., Minneapolis, Minn.  
 Maurice Pincoffs Co., M and M Bldg., Houston, Texas.  
 Pittsburgh Plate Glass Co., Linseed Oil Division, Newark, N. J.  
 W. N. Potter Grain Stores, Inc., Greenfield, Mass.  
 H. C. Puffer Co., Springfield, Mass.

Quaker Oats Co., 141 West Jackson Blvd., Chicago, Ill.  
 Ralston Purina Co., St. Louis, Mo.  
 John Reardon & Sons Co., Cambridge, Mass.  
 D. F. Riley, North Hatfield, Mass.  
 N. Roy & Son, Rear 618 Newport Ave., South Attleboro, Mass.  
 H. M. Rubin Co., Inc., 9-19 38th Ave., Long Island City, N. Y.  
 Russell-Miller Milling Co., Minneapolis, Minn.  
 Ryther & Warren, Belchertown, Mass.  
 St. Albans Grain Co., St. Albans, Vt. (Registered also for Cutler Co., North Wilbraham, Mass. and Taft Bros., Uxbridge, Mass.)  
 St. Lawrence Flour Mills Co., Ltd., 2110 Notre Dame St. West, Montreal, Canada.  
 Schenley Products Co., Inc., 20 West 40th St., New York, N. Y.  
 Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland, Ohio.  
 Sherwin-Williams Co. of Canada, Ltd. (Registered by Chas. M. Cox Co.)  
 W. J. Small Hay & Grain Co., Neodesha, Kan.  
 Mrs. Annie P. Smith, 102 Hale St., Haverhill, Mass.  
 Smith, Bodfish, Swift Co., Vineyard Haven, Mass.  
 Snow Brokerage Co., 3039 East Twelfth St., Los Angeles, Cal.  
 Southern Cotton Oil Co., Goldsboro, N. C.  
 Squier & Co., Monson, Mass. (Registered by Delaware Mills, Inc.)  
 A. E. Staley Manufacturing Co., Decatur, Ill.  
 State Mill & Elevator, Grand Forks, N. Dak.  
 Stoughton Grain Co., Stoughton, Mass.  
 Stratton & Co., Concord, N. H.  
 Swift & Co., Union Stock Yards, Chicago, Ill.  
 Swift & Company Oil Mills, Atlanta, Ga.  
 C. H. Symmes & Co., Winchester, Mass.  
 Taft Bros., Uxbridge, Mass. (Registered by St. Albans Grain Co.)  
 Texas Star Flour Mills, Galveston, Texas.  
 Tioga Mills, Inc., Waverly, N. Y.  
 Transit Milling Co., Galveston, Texas.  
 Jacob Trinley & Sons, Linfield, Penn.  
 Union Starch & Refining Co., Columbus, Ind.  
 United Cooperative Farmers, Inc., Fitchburg, Mass.  
 United Farmers Cooperative Creamery Association, Inc., 86 Cambridge St., Charlestown, Mass.  
 Unity Feeds, Inc., 177 Milk St., Boston, Mass.  
 Arthur Ventura, 7 Purchase St., Taunton, Mass.  
 Victor Flour Mills, Inc., Pittsford, N. Y.  
 Hiram Walker & Sons, Inc., Peoria, Ill.  
 Ward Dry Milk Co., St. Paul, Minn.  
 C. P. Washburn Co., Middleboro, Mass.  
 Wayne County Grangers Feed Corp., Clyde, N. Y.  
 H. K. Webster Co., Lawrence, Mass.  
 West-Nesbitt, Inc., Oneonta, N. Y.  
 Western Condensing Co., Petaluma, Cal. (Golden Eagle Milling Co., Distributors.)  
 Wilbur Feed Co., Inc., Jamestown, N. Y.  
 Est. M. G. Williams, Box 603, Taunton, Mass.  
 Wilmington Packing Co., New Boston St., Woburn, Mass. (Registered by Great Eastern Feed Mills).  
 Wilson & Co., Inc., 41st St. and South Ashland Ave., Chicago, Ill.  
 Stanley Wood Grain Co., Taunton, Mass.  
 Worcester Grain & Coal Co., Worcester, Mass.









MASSACHUSETTS  
AGRICULTURAL EXPERIMENT STATION

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CONTROL SERIES

BULLETIN No. 90

NOVEMBER, 1937

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Inspection of Commercial  
Fertilizers

By H. D. Haskins

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This is the sixty-fourth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

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Massachusetts State College  
Amherst, Mass.

# INSPECTION OF COMMERCIAL FERTILIZERS FOR THE SEASON OF 1937

By H. D. Haskins, Official Chemist<sup>1</sup>

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## MANUFACTURERS AND BRANDS

Registrations have been perfected in Massachusetts during 1937 by 94 firms, covering 497 brands of mixed fertilizer and unmixed fertilizing materials. The nature of these products is shown by the following classification:

Complete fertilizers . . . . .	303
Ammoniated superphosphates . . . . .	3
Superphosphates with potash . . . . .	1
Dry ground fish, tankage and ground bone . . . . .	45
Fertilizer simples, including organic nitrogen compounds . . . . .	96
Tobacco stems . . . . .	1
Pulverized manures . . . . .	32
Cotton hull ashes and wood ashes . . . . .	7
Peat products . . . . .	3
Stone meal . . . . .	1
Nitrate of potash . . . . .	5
Total . . . . .	497

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<sup>1</sup>Assisted by H. Robert DeRose, John W. Kuzmeski, Albert F. Spelman, Stuart P. Stiles, Chemists; Louis A. Graves, C. L. Whiting, G. E. Taylor, Sampling Agents; Harry L. Allen, Laboratory Assistant; Cora B. Grover, Clerk.

The following brands were not found on display by the sampling agents at any point in the state and therefore do not appear in the tables of analyses.

### Brands of Fertilizer Registered but Not Sampled

<b>Acme Guano Co.</b> Sergent's 4-6-10 Sergent's 4-8-6	<b>Eastern States Farmers' Exchange</b> Eastern States Castor Pomace (4.5-0-0)
<b>Apothecaries Hall Co.</b> Liberty Fertilizer 8-15-16 Liberty Onion Special (Potash as Sulfate) 4-8-7 Liberty Potato and Vegetable 2-8-10 Castor Pomace (4.52-0-0) Linseed Meal (5-0-0)	<b>Humphreys-Godwin Co.</b> Bull Brand Cottonseed Meal (6.87-0-0)
<b>Armour Fertilizer Works</b> Armours Vert Plant Food 5-8-6 Fish (9.46-5-0)	<b>International Agricultural Corp.</b> International 4-10-6
<b>Berkshire Chemical Co.</b> Berkshire Complete Tobacco Fertilizer 5-3-5 Berkshire 5-8-10	<b>Spencer Kellogg &amp; Sons, Inc.</b> Castor Pomace (4.52-0-0)
<b>Chilean Nitrate Sales Corp.</b> Old Style Chilean Nitrate of Soda (16-0-0)	<b>Old Deerfield Fertilizer Co., Inc.</b> Cotton Hull Ashes (0-0-30) Linseed Meal (5.44-0-0)
<b>Consolidated Rendering Co.</b> Superphosphate (0-20-0)	<b>Olds &amp; Whipple, Inc.</b> O & W 5-8-10 Fertilizer
	<b>Rogers &amp; Hubbard Co.</b> Red H 8-16-14 with Sulfate of Potash
	<b>Standard Wholesale Phosphate and Acid Works, Inc.</b> Standard 4-8-8 Standard 5-8-10

### Drawing of Samples

Between April 1 and June 14, three sampling agents made a thorough canvass of the state: Louis A. Graves in Hampshire, Hampden, Franklin and Berkshire Counties; G. E. Taylor in Norfolk, Bristol, Plymouth, Barnstable and Dukes Counties; and C. L. Whiting in Essex, Middlesex, Suffolk and Worcester Counties. They visited 191 towns, took 1,697 samples, representing 494 brands, from stock in the possession of 480 agents or owners, and called upon 356 agents where no samples were drawn because the agency had been discontinued, the stock was all sold out, or sufficient samples had already been taken of the brands found. They sampled 19,246 sacks, representing 16,486 tons of fertilizer. One ton was sampled to every four and one-half tons sold in the state.

### COMPARATIVE COST OF FERTILIZER CHEMICALS AND UNMIXED FERTILIZER PRODUCTS

Ammonium sulfate, nitrate of soda, and calcium nitrate have shown a moderate advance in price during 1937. Nitrate of potash has shown a marked increase in price over the preceding year and, most likely due to war conditions in Spain and in China, the salt has been largely absorbed by munition manufacturers so that its present price almost prohibits its use as a fertilizer.

Cyanamid and urea continue to be the cheapest source of organic nitrogen, the former showing a constant advance in price and the latter a \$6.00 decline in price. However, on September 27, the quotations for synthetic urea had increased to about the same as for the six months' average for 1936.

Organic animal ammoniates, dry ground fish, cottonseed meal, and castor pomace have all registered an increase for the six months ending March 1, 1937 as compared with average quotations for a like period in 1936. It should be noted, however, that quotations on dried blood, tankage, and cottonseed meal for September 27 show a considerable decline in price over the six months' average.

## Wholesale Quotations on Chemicals and Unmixed Materials

NATURE OF MATERIAL	AVERAGE PRICE PER TON FOR SIX MONTHS PRECEDING MARCH 1		Price Per Ton Sept. 27, 1937	Difference Between Sept. 27 Price and Six Months' Average: Sept. 1, 1936- Mar. 1, 1937
	1936	1937		
Ammonium sulfate (20.5% N), 200 lbs., northern ports	\$25.50	\$24.86	\$27.50	+\$2.64
Nitrate of soda (15.5% N), bags, natural or synthetic ex vessel	25.50	27.33	28.30	+ .97
Nitrate of lime (15% N), bags, northern ports, ex vessel	24.75	26.26	27.50	+ 1.24
Nitrate of potash (13% N, 44% K <sub>2</sub> O), bags, c.i.f. ports	45.90	52.70	63.20	+10.50
Urea (46% N), car lots, bags, ex vessel	101.88	95.00	101.00	+ 6.00
Cyanamid	—	26.65	29.36	+ 2.71
Dried blood (12.34% N), ground, bulk, New York	45.51	65.27	56.00	— 9.27
Hoof meal (14.15% N), f.o.b. Chicago	46.91	50.93	57.80	+ 6.87
Animal tankage (8.23% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), ground, bulk, New York	30.58	42.05	35.50	— 6.55
Dry ground fish (9.02% N, 6.86% P <sub>2</sub> O <sub>5</sub> ), bags, Baltimore	40.04	51.62	52.00	+ .38
Cottonseed meal (5.75% N), bags, at mill	22.39	31.37	20.50	—10.87
Castor pomace (4.52% N), bags, car lots, f.o.b. works	16.25	19.50	23.00	+ 3.50
Ground bone (2.47% N, 22.88% P <sub>2</sub> O <sub>5</sub> ), bags, f.o.b. Chicago	18.31	20.30	22.00	+ 1.70
Superphosphate (16% avail. P <sub>2</sub> O <sub>5</sub> ), bulk, f.o.b. Baltimore	8.25	8.09	8.50	+ .41
Muriate of potash (50.54% K <sub>2</sub> O), bags, c.i.f. ports	22.50	25.00	26.75	+ 1.75
High grade sulfate of potash (48.65% K <sub>2</sub> O), bags, c.i.f. ports	33.75	36.25	38.00	+ 1.75
Potash-magnesia sulfate (25.94% K <sub>2</sub> O), bags	22.25	24.75	25.75	+ 1.00
Cotton hull ashes (25% K <sub>2</sub> O), bulk, delivered, car lots	23.28	25.00	26.25	+ 1.25

## Fertilizer Trade Values

FORM OF PLANT FOOD	Value per Pound	Unit Value
Nitrogen		
In ammonia salts	\$0.081	\$1.62
In nitrates	.105	2.10
Organic nitrogen in fish	.325	6.50
Organic nitrogen in blood, meat and hoof meal	.275	5.50
Organic nitrogen in fine <sup>1</sup> bone and tankage	.315	6.30
Organic nitrogen in coarse <sup>1</sup> bone and tankage, and in pulverized manures	.225	4.50
Organic nitrogen in mixed fertilizers	.245	4.90
Organic nitrogen in cottonseed meal, castor pomace, linseed meal, etc.	.29	5.80
Organic nitrogen in calurea and urea	.115	2.30
Organic nitrogen in cyanamid	.0635	1.27
Phosphoric Acid		
Available (soluble in water and neutral citrate of ammonia)	.05	1.00
In precipitated bone	.0475	.95
In basic slag phosphate	.06	1.20
In fine <sup>1</sup> bone and tankage, and in fish	.045	.90
In coarse <sup>1</sup> bone and tankage	.0375	.75
In pulverized manures, seed residues, and ashes	.0375	.75
Insoluble in neutral citrate of ammonia in mixed fertilizers	.016	.32
Potash		
As sulfate	.045	.90
As muriate	.03	.60
As carbonate	.095	1.90
As nitrate	.03	.60
In potash-magnesia sulfate	.057	1.14
In cottonhull and wood ashes (soluble)	.067	1.34
In organic vegetable compounds, sheep manure, insoluble in ashes	.035	.70
Magnesium Oxide		
Water soluble from Kieserite and Emjeo	.0527	1.054
In form of finely ground dolomite	.00625	.125

<sup>1</sup> Fine bone and tankage refers to particles which, as sampled, will pass through a sieve with circular openings 1/50 of an inch in diameter. Coarse bone and tankage refers to that portion which will not pass through the sieve.

Superphosphate, which is the principal source of available phosphoric acid has shown a small decline in price during the season, but has recovered with the advent of the fall trade and is now quoted at 25c per ton above the six months' average for 1936.

The three potash salts quoted have shown an average increase in cost of about 11% over the six months' average for 1936 and on September 27 were showing a considerable increase over the average quotations prevailing for the six months ending March 1, 1937.

From this summary it would not be surprising if a small advance in price of mixed commercial fertilizer prevailed for 1938.

The fertilizer trade values are based on average wholesale quotations of fertilizer chemicals and unmixed materials, as taken from trade journals for six months ending March 1, 1937, to which 20 percent has been added for overhead. When appropriate, an additional allowance has also been made for bags, labor, and transportation.

### FERTILIZER TONNAGE

#### Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts

	July 1, 1934, to July 1, 1935	July 1, 1935, to July 1, 1936	July 1, 1936, to July 1, 1937
Mixed fertilizers	42,912	43,682	48,527
Fertilizer chemicals and materials unmixed	18,711	19,165	24,004
Pulverized natural manures . . . . .	1,585	1,634	1,743
Totals . . . . .	63,208	64,481	74,274

There were 9,793 tons more fertilizer sold in the state in 1937 than during the previous year. The tonnage of mixed fertilizer was 4,845 more, and that of the fertilizer chemicals and unmixed materials was 4,839 more than for 1936. Pulverized manures showed an increase of 109 tons. Of the total tonnage sold, 65.33 percent was mixed fertilizer, 32.32 percent was unmixed materials, and 2.35 percent was dried and pulverized natural manures.

### Plant Food Tonnage

	Nitrogen		Phosphoric Acid		Potash	
	1936	1937	1936	1937	1936	1937
Mixed fertilizers	2,238*	2,548*	3,727*	4,138*	3,097*	3,468*
Fertilizer chemicals and materials unmixed	1,386	1,579	1,667	2,376	672	821
Pulverized natural manures . . . . .	35	36	25	26	47	44
Totals . . . . .	3,659	4,163	5,419	6,540	3,816	4,333

\* Does not include plant food tonnage of fertilizer mixed for special orders.

There were 2,142 more tons of plant food sold in the state than during 1936, of which 504 tons were nitrogen, 1,121 tons available phosphoric acid, and 517 tons potash.

There were 15,036 tons of plant food sold, of which 28 percent was nitrogen, 43 percent available phosphoric acid, and 29 percent potash. Mixed fertilizers furnished 67.5 percent of the plant food, chemicals and unmixed materials 31.8 percent, and pulverized manures 0.7 percent.



The three plant food elements were furnished in the following proportions by the mixed fertilizers and the unmixed materials, including the pulverized manures: nitrogen, 61 percent from mixed and 39 percent from unmixed; phosphoric acid, 63 percent from mixed and 37 percent from unmixed; potash, 80 percent from mixed and 20 percent from unmixed.

The tables present tonnage figures for one year, July 1, 1936, to July 1, 1937, for both mixed fertilizers and unmixed fertilizer materials. In case of the mixed fertilizers, the grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

### Tonnage of Mixed Fertilizers

#### COMPLETE FERTILIZERS

#### 14 Percent or More of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash)

Grade	Tonnage	Brands	Grade	Tonnage	Brands
5-8-7	14,206	23	7-7-5	91	-
4-8-4	6,804	23	4-12-6	86	-
4-8-7	3,214	17	4-3-12	83	-
7-6-6	2,668	13	5-9-8	82	-
6-3-6	2,573	8	2-8-10	77	-
4-8-10	2,330	11	7-12-10	74	-
4-8-8	1,652	6	8-6-6	68	-
5-8-10	1,316	13	5-4-15	65	-
8-16-16	1,160	7	5-5-15	64	-
4-12-4	1,154	5	2-12-4	50	-
6-3-7	1,132	-	7-3-7	46	-
3-10-4	967	9	10-3-3	41	-
8-16-14	828	12	4-10-6	40	-
3-10-6	710	-	2-10-2	34	-
4-10-4	668	-	8-6-4	34	-
6-8-6	632	5	8-20-12	33	-
8-24-8	390	-	3-7-6	31	-
5-6-4	381	-	10-5-10	26	-
12-16-12	269	-	3-12-6	24	-
5-10-5	258	-	5-9-2	23	-
5-10-4	230	-	7-8-6	23	-
10-6-4	229	5	6-11-10	22	-
5-10-10	205	-	6-8-2	21	-
8-5-8	188	-	8-4-8	20	-
8-16-20	170	-	5-8-6	14	-
8-12-20	152	-	15-30-15	14	-
4-16-20	142	-	3-8-4	13	-
8-6-2	137	-	5-10-7	12	-
12-4-4	135	-	5-8-5	11	-
5-8-12	128	-	8-6-3	11	-
9-6-6	125	-	6-12-4	10	-
6-6-5	117	-	8-8-8	10	-
6-7-4	112	-	10-6-6	10	-
5-5-5	110	-	10-16-14	10	-
7-5-3	99	-	Miscellaneous	80	23
4-6-10	95	-	Special Mixtures	375	-
5-7-3	92	-			
6-6-4	91	-	Totals	47,597	287

#### Less than 14 Percent of Available Plant Food (Nitrogen, Available Phosphoric Acid and Potash)

5-3-5	637	6	5-6-2	13	-
4-3-1	176	-	3-3-2	10	-
4-2-2	30	-	Miscellaneous	4	-
3-3-3	16	-			
4-6-3	15	-	Totals	901	17

#### SUPERPHOSPHATE WITH POTASH

0-20-20	28	-	0-14-6	1	-
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Of the 48,527 tons of complete fertilizer sold, 74 percent was furnished by 9 grades and 126 brands. Double- and multiple-strength grades totaled 3,267 tons and 36 brands, which was 851 tons more than during the previous year.

Of the mixed fertilizer sold, 98 percent contained 14 percent or over of available plant food.

There were 469 tons more of low-analysis (less than 14 percent available plant food) complete fertilizers sold than in 1936. The 5-3-5 grade, comprising 6 brands, furnished 71 percent of the tonnage of this class of goods.

In the following table are listed ten of the most popular grades of mixed fertilizer together with the tonnage of each sold in Massachusetts for the years 1936 and 1937.

1936		1937	
GRADE	Tonnage	GRADE	Tonnage
5-8-7 . . . . .	13,752	5-8-7 . . . . .	14,206
4-8-4 . . . . .	7,122	4-8-4 . . . . .	6,804
4-8-7 . . . . .	3,526	4-8-7 . . . . .	3,214
7-6-6 . . . . .	2,074	7-6-6 . . . . .	2,668
4-8-10 . . . . .	2,053	6-3-6 . . . . .	2,573
6-3-6 . . . . .	1,402	4-8-10 . . . . .	2,330
4-8-8 . . . . .	1,112	4-8-8 . . . . .	1,652
3-10-4 . . . . .	1,013	5-8-10 . . . . .	1,316
4-12-4 . . . . .	983	8-16-16 . . . . .	1,160
5-8-10 . . . . .	930	4-12-4 . . . . .	1,154

The following table shows how the tonnage sold in 1937 corresponds with the New England Standard Nine grades selected by the New England Agronomists in 1931.

NEW ENGLAND STANDARD NINE GRADES	Tonnage	Additional Tonnage from Grades Varying but 1% in One or More Plant Foods	Total
5-8-7 . . . . .	14,216 <sup>a</sup>	8,536 <sup>b</sup>	22,752
4-8-4 . . . . .	7,076 <sup>c</sup>	124	7,200
6-3-6 . . . . .	2,619 <sup>d</sup>	1,815	4,434
7-6-6 . . . . .	2,668	276	2,944
4-8-10 . . . . .	2,482 <sup>e</sup>	—	2,482
3-10-4 . . . . .	967	672	1,639
5-8-10 . . . . .	1,316	—	1,316
2-8-10 . . . . .	219 <sup>f</sup>	—	219
2-12-4 . . . . .	50	—	50
Totals . . . . .	31,613	11,423	43,036

<sup>a</sup> Including 10 tons of 10-16-14.

<sup>b</sup> Including 1,160 tons of 8-16-16, 828 tons of 8-16-14, 269 tons of 12-16-12 and 2 tons of 10-18-12.

<sup>c</sup> Including 258 tons of 5-10-5 and 14 tons of 15-30-15.

<sup>d</sup> Including 26 tons of 10-5-10 and 20 tons of 8-4-8.

<sup>e</sup> Including 152 tons of 8-16-20.

<sup>f</sup> Including 142 tons of 4-16-20.

Of the total tonnage of mixed fertilizer sold in Massachusetts, 65 percent was from grades recommended by New England Agronomists to meet New England conditions, and 24 percent additional tonnage was from grades varying but one percent in one or more plant food elements from the grades thus recommended. Of the ten grades, including the multiple-strength mixtures, that have the highest tonnage (37,077 tons), all but four were among the New England Standard Nine. These six grades showed a total tonnage of 29,897.

Over 21 percent of the total tonnage of mixed fertilizer was from five grades not included in the New England Standard Nine. They are 4-8-7, 8-16-14, third largest tonnage sold; 4-8-8, 8-16-16, fourth largest; 4-12-4, 8-24-8, eighth largest; 6-3-7, eleventh largest; and 3-10-6, twelfth largest.

The tonnage of unmixed materials, as shown in the following table, was distributed as follows: nitrogen products, 36 percent; phosphoric acid products, 36 percent; potash products, 6 percent; tankage, fish, bone, nitrate of potash, Ammo-Phos, and wood ashes, 17 percent; and miscellaneous, 5 percent. Pulverized animal manures are not included.

### Tonnage of Unmixed Fertilizing Materials

MATERIAL	Tonnage	Brands	MATERIAL	Tonnage	Brands
Superphosphate 16% . . .	5,846	12	Cal-Nitro . . . . .	257	-
Nitrate of soda . . . . .	3,776	7	Dry ground fish . . . . .	166	10
Ground bone . . . . .	2,658	22	Ammo-Phos . . . . .	165	-
Superphosphate 20% . . .	2,603	10	Castor pomace . . . . .	163	7
Pulverized animal manures	1,743	32	Linseed meal . . . . .	147	-
Cyanamid . . . . .	1,383	-	Basic slag phosphate . . .	139	-
Cottonseed meal . . . . .	1,541	7	Stone meal . . . . .	132	-
Sulfate of ammonia . . . .	905	11	Sulfate of potash . . . . .	112	-
Milorganite . . . . .	811	-	Wood ashes . . . . .	98	-
Muriate of potash 60% . .	745	7	Cotton hull ashes . . . . .	90	5
Nitrate of potash . . . . .	517	5	Superphosphate 40% . . .	73	5
Cottonseed meal and castor			Dried blood . . . . .	23	-
pomace mixture . . . . .	515	-	Urea . . . . .	15	-
Muriate of potash 50% . .	398	-	Miscellaneous . . . . .	43	7
Animal tankage . . . . .	368	11			
Peat . . . . .	315	-			
			Totals . . . . .	25,747	192

## MIXED FERTILIZERS

## Deficiency Statistics for Mixed Fertilizers

MANUFACTURER	NUMBER OF BRANDS		NUMBER OF TESTS OR DETERMINATIONS				
	Analyzed	Approximately Equal to Guarantee in Commercial Valuation	Totals (a)	Not Exceeding $\frac{1}{4}$ Percent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Percent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Percent Below Guarantee	More than $\frac{3}{4}$ Percent Below Guarantee
Acme Guano Co.	5	4	15	4	2	0	1
Agricultural Laboratories, Inc.	1	1	3	1	0	0	0
American Agricultural Chemical Co.	52	52	156	22	6	0	4
American Soda Products Co.	1	1	3	0	0	0	0
Apothecaries Hall Co.	17	17	50	3	1	0	0
Armour Fertilizer Works	22	22	66	5	0	0	0
Atlantic States Fertilizer Co.	1	1	3	0	0	0	0
Barrie Laboratories, Inc.	1	1	3	0	0	0	0
F. A. Bartlett Tree Expert Co.	1	1	3	0	0	0	0
Belmont Gardens	1	1	3	0	1	0	0
Berkshire Chemical Co.	11	11	33	4	2	0	0
Woodworth Bradley, Inc.	1	1	3	0	1	0	0
Joseph Breck & Sons Corp.	3	3	9	0	0	0	0
Clay & Son, Ltd.	1	1	3	0	0	0	0
Collins Seed Service Co.	4	4	12	0	0	0	0
Consolidated Rendering Co.	24	24	75	5	2	0	0
Davey Tree Expert Co.	1	1	3	0	0	0	0
Davison Chemical Corp.	2	2	6	2	0	0	0
Eastern States Farmers' Exchange	16	16	62	0	1	0	0
Thomas W. Emerson Co.	1	1	3	0	0	0	0
Excell Laboratories	1	1	3	1	0	0	0
Flower City Charcoal Co.	2	1	6	0	1	0	1
Flower City Plant Food Co.	1	1	3	0	0	0	0
H. L. Frost & Higgins Co.	2	1	6	0	0	0	1
Garden Hose Spray Co., Inc.	1	1	3	0	1	0	0
Goulard & Olena, Inc.	2	2	6	2	0	0	0
Thomas J. Grey Co.	1	1	3	0	0	0	0
Allen Hersom & Co.	2	2	6	1	0	0	0
A. H. Hoffman, Inc.	1	1	3	0	0	0	0
International Agricultural Corp.	18	18	60	7	3	1	0
Lowell Fertilizer Co.	4	4	12	1	0	0	0
McClain Brothers Co.	1	1	3	1	0	0	0
Master Meat Products Co.	1	1	3	0	0	0	0
New England Toro Co.	1	1	3	0	0	0	0
Old Deerfield Fertilizer Co., Inc.	21	20	63	1	1	0	1
Olds & Whipple, Inc.	13	13	39	2	1	0	0
Organic Fertilizer Corp.	1	1	3	1	0	0	0
F. G. Phillips Co.	1	1	3	0	0	0	0
Plantabbs Corp.	1	1	3	0	0	0	0
Plantspur Products Co., Inc.	1	1	3	1	0	0	0
Rogers & Hubbard Co.	25	25	75	3	1	0	0
Salem Chemical & Supply Co.	1	1	3	0	0	0	0
O. M. Scott & Sons Co.	1	1	3	0	0	0	1
Standard Wholesale Phosphate & Acid Works, Inc.	9	9	27	1	3	2	0
Sutton & Sons, Ltd.	1	1	3	1	0	0	0
Swift & Company Fertilizer Works	4	3	12	1	1	0	1
F. Sylvester & Sons	1	1	3	0	0	0	0
Synthetic Nitrogen Products Corp.	1	1	3	0	0	0	0
Tennessee Corp.	2	2	6	0	0	0	0
Universal Chemical Co.	1	1	3	1	0	0	0
Virginia-Carolina Chemical Corp.	2	2	6	1	0	0	0
C. P. Washburn Co.	4	4	12	1	0	0	0
Winslow Nurseries	1	1	3	0	0	0	0
F. H. Woodruff & Sons	1	1	3	1	0	0	0
Totals	296	291	910	74	28	3	10

a Several analyses of the same brand have been averaged and recorded in the table as one analysis. Analyses of fertilizer left over from previous year not included.

## Summary of Deficiencies in Mixed Fertilizers

	1935	1936	1937
Brands deficient in one element . . . . .	42	61	77
Brands deficient in two elements . . . . .	7	7	16
Brands deficient in three elements . . . . .	2	2	2
Brands deficient in nitrogen . . . . .	20	22	39
Brands deficient in available phosphoric acid . . . . .	22	33	29
Brands deficient in potash . . . . .	17	26	47
Brands deficient in magnesium oxide . . . . .	3	0	0

## Serious Commercial Shortages in Mixed Fertilizers

AMOUNT OF SHORTAGE PER TON	NUMBER OF BRANDS ACCORDING TO YEARS			
	1934	1935	1936	1937
More than \$5 . . . . .	1	1	none	1
Between \$4 and \$5 . . . . .	none	none	none	none
Between \$3 and \$4 . . . . .	none	1	1	none
Between \$2 and \$3 . . . . .	none	none	none	3
Between \$1 and \$2 . . . . .	1	2	none	3

Of the 296 brands analyzed, 202, or 68 percent, showed no deficiencies. Out of 910 plant food guarantees made, 87 percent were fully maintained.

The deficiency table shows the following statistics:

Deficiencies not exceeding  $\frac{1}{4}$  of one percent, 74.

Deficiencies between  $\frac{1}{4}$  and  $\frac{1}{2}$  of one percent, 28.

Deficiencies between  $\frac{1}{2}$  and  $\frac{3}{4}$  of one percent, 3.

Deficiencies more than  $\frac{3}{4}$  of one percent, 10.

Of the total number of guarantees of each element made, 13 percent of the nitrogen, 10 percent of the available phosphoric acid, and 16 percent of the potash were not met. Twenty-five of the 39 nitrogen deficiencies, 19 of the 29 available phosphoric acid deficiencies, and 30 of the 47 potash deficiencies did not exceed  $\frac{1}{4}$  of one percent.

Compared with the 1936 inspection, there were 17 more shortages in nitrogen, 4 less in available phosphoric acid, and 21 more in potash.

In the case of those fertilizers which did not conform strictly to the guarantee, the discrepancies were of such a character as to make it evident that there was no intentional attempt at violation of the regulations.

Twelve firms have registered five or more brands of mixed fertilizers. On the basis of composition found by analysis as well as upon tonnage sold, the following table shows to what extent each manufacturer was successful in avoiding deficiencies in plant food guarantees in his mixtures. All but three of the twelve firms provided an average overrun in the three major plant food elements guaranteed, considered desirable in safe fertilizer practice.

## Mixing Efficiency Table

MANUFACTURER	AVERAGE PERCENTAGE OF PLANT FOOD ABOVE OR BELOW THE MINIMUM GUARANTEE		
	Nitrogen	Available Phosphoric Acid	Potash
Acme Guano Co.	+ .21	— .14	+ .07
American Agricultural Chemical Co.	+ .02	+ .49	+ .02
Apothecaries Hall Co.	+ .30	+ .64	+ .34
Armour Fertilizer Works	+ .21	+ .24	+ .13
Berkshire Chemical Co.	+ .05	+ .29	— .02
Consolidated Rendering Co.	+ .19	+ .45	+ .33
Eastern States Farmers' Exchange	+ .34	+ .64	+ .71
International Agricultural Corp.	+ .06	+ .33	+ .04
Old Deerfield Fertilizer Co., Inc.	+ .42	+ .71	+ .78
Olds & Whipple, Inc.	+ .37	+ .22	+ .76
Rogers & Hubbard Co.	+ .29	+ .23	+ .46
Standard Wholesale Phosphate & Acid Works, Inc.	— .03	+ .39	+ .68

## Summary of Data on Acid and Basic Fertilizers

FERTILIZER TONNAGE TESTED					EXTENT OF ACIDITY OR BASICITY OF FERTILIZER SOLD, EXPRESSED IN TONS OF CALCIUM CARBONATE (CaCO <sub>3</sub> )				
	1934	1935	1936	1937		1934	1935	1936	1937
Acid . . .	35,205	35,715	34,746	32,957	Acidity . . .	4,812	3,840	3,826	3,596
Basic . . .	4,523	6,967	8,393	14,377	Basicity . . .	149	445	571	984
Total . . .	39,728	42,682	43,139	47,834	Net acidity*	4,663	3,395	3,255	2,612
					Average acidity*	235	159	151	109

\* The net acidity is the total amount of calcium carbonate, expressed in tons, which would be required to neutralize all the fertilizer tested.

The average acidity is the average amount of calcium carbonate, expressed in pounds, which would have to be added to each ton of mixed fertilizer to make neutral all of the fertilizer tested.

## AVERAGE ANALYSIS OF MIXED FERTILIZERS\*

	1934	1935		1936		1937	
	Found	Guaran- teed	Found	Guaran- teed	Found	Guaran- teed	Found
Nitrogen	5.08	4.82	5.26	4.96	5.18	5.05	5.29
Available phosphoric acid	8.61	8.04	8.90	8.26	8.63	8.13	8.59
Potash	6.89	6.59	7.19	6.82	7.17	6.91	7.20

\*Does not include fertilizer mixed for special orders.

During the past three years, the average guarantee of the mixed fertilizers has been higher each year than the preceding year, with the exception of the average guaranteed available phosphoric acid which is slightly lower in 1937. Nearly 2,000 tons more of the tobacco grades were sold in 1937 than during the previous year; and this, most likely, is the principal reason for the somewhat lower average phosphoric acid both found and guaranteed for 1937. The tobacco grades usually carry a phosphoric acid guarantee of about 3 percent.

**Explanation of Tables of Analyses.**

**Guarantee.** The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand," and is expressed as nitrogen, available phosphoric acid and water soluble potash and in that order.

**Commercial Shortages.** In the table designated "Mixtures showing a commercial shortage of \$1 or more per ton," the column headed "Approximate commercial valuation per ton" gives the sum of the valuation of each plant food element computed from the analysis by use of the trade values adopted by the Massachusetts Fertilizer Control for 1937, which appear on a preceding page of the bulletin.

Under the heading "Approximate commercial shortage per ton" is shown the commercial valuation of the deficiencies or tests found below the guarantee after allowance is made for the value of overruns or tests above the guarantee.

Deficiencies are emphasized by boldface type.

**Mixtures Substantially Complying with the Guarantee.** In addition to the analysis of those fertilizers substantially complying with the guarantee, this table includes also those mixtures that are more or less out of balance; that is, having deficiencies in one or more plant food elements, but having overruns which largely offset the value of the deficiencies.

"Number of samples" indicates the number of samples included in the composite which was analyzed.

**Inferior Nitrogen.** The presence of inferior forms of organic nitrogen is indicated by footnotes.

**Potash Forms.** Wherever tests for chlorine showed a sufficient amount present to unite with all of the potash found, the source of the potash is designated as muriate. Wherever insufficient chlorine was found to account for all of the potash, it is evident that forms of potash other than muriate were used. In such cases, the figures under the sub-heading "As muriate" do not imply necessarily that muriate of potash was actually added to the mixture, but that chlorine was present, probably from impurities in the fertilizer chemicals, in amounts to account for the percentage of potash indicated. The balance of the potash found is listed under the sub-heading "In forms other than muriate" and may be derived from sulfate, nitrate, or carbonate, as the case may be.

Mixtures Showing a Commerical Shortage of \$1 or More Per Ton

NAME OF MANUFACTURER AND BRAND	Where Sampled	Approximate Commercial Valuation Per Ton	Approximate Commercial Shortage Per Ton	NITROGEN FOUND				PHOSPHORIC ACID FOUND		POTASH (K <sub>2</sub> O) FOUND	
				In Ammoniacal Forms	In Nitrate Forms	In Organic Forms	Total	Avail-able	Total	As Muriate	In Forms Other than Muriate
Acme Guano Co. Sergeant's 7-6-6	Taunton	\$30.05	\$1.17	3.28	.51	2.94	6.73	5.62	6.16	5.78	-
Flower City Charcoal Co. Char-Gro 4-16-4	Manufacturer	24.81	1.32	3.16	.18	.32	3.66	14.67	15.13	4.78	-
H. L. Frost & Higgins Co. Frost's Shade Tree Special 10-6-6	Arlington	34.64	6.23	2.23	2.24	3.20	7.67	6.39	8.29	6.06	-
International Agricultural Corp. International Caribee 7-5-3 (a)	North Attleboro	25.06	1.44	2.91	1.60	2.07	6.58	4.98	5.11	1.64	.94
Old Deerfield Fertilizer Co., Inc. Old Deerfield Concentrated 8-16-20 (Potash other than Muriate) (b)	South Deerfield	53.04	2.13	3.18	1.00	3.57	7.75	15.37	15.87	13.70	5.05
Swift & Company Fertilizer Works Swift's Special Golf Fertilizer 12-6-4	North Scituate	29.89	2.28	8.66	-	1.07	9.73	7.60	7.73	4.97	-
Swift's Special Golf Fertilizer 12-6-4	Quincy	29.11	2.00	8.45	.43	.74	9.62	7.68	7.81	5.28	-

a Magnesium oxide found, 3.99 %, guaranteed. 2.00 %. Four other samples showed shortages of 62c, 78c, 90c and 19c; two samples showed no shortage.  
b One other sample showed a shortage of 65c.



## Mixtures Substantially Complying with Guarantees

Number of Samples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND				Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND	
		In Ammoniacal Forms	In Nitrate Forms	In Organic Forms	Total		As Muriate	In Forms Other than Muriate
3	Acme Guano Co. Acme 4-8-7 Sergeant's Mixture	3.31	.22	.67	4.20	7.84	6.27	.82
1	Acme Vitaflor 4-8-5	.90	.10	3.69	4.69	7.12	5.33	1.67
1	Sergeant's 4-8-4	3.05	.89	.86	4.80	8.12	2.86	1.18
2	Sergeant's 5-8-7	3.50	.68	.72	4.90	8.09	6.80	-
1	Agricultural Laboratories, Inc. Stim-U-Plant 11-12-15	2.79	9.98	-	12.77	11.83	-	19.60
1	American Agricultural Chemical Co. AA 4-8-8 Fertilizer	2.70	.33	1.18	4.21	8.00	8.13	-
2	AA 4-12-4 Fertilizer	2.47	.66	1.01	4.14	12.35	4.07	-
1	AA 4-16-20 Fertilizer	2.82	.88	.51	4.21	17.54	19.82	-
2	AA 6-8-6 Fertilizer	4.88	.81	.66	6.35	8.17	6.10	-
1	AA 8-16-16 Fertilizer	6.73	.97	.46	8.16	16.89	15.95	-
1	AA 8-24-8 Fertilizer	7.09	.74	.44	8.27	24.10	7.73	.56
2	AA Complete Manure with 10% Potash 4-8-10	2.76	.27	.93	3.96	8.27	10.11	-
5	AA Complete Manure with 10% Potash 4-8-10	2.72	.47	.96	4.15	8.45	9.93	-
2	AA Corn Favorite 8-10-4	2.00	.10	.92	3.02	9.50	4.22	-
6	AA Corn Favorite 3-10-4	2.22	.31	.93	3.46	10.49	4.59	-
4	AA Cranberry Fertilizer 5-6-4	2.64	1.88	.67	5.19	6.71	4.08	-
3	AA Double Strength Fertilizer 8-16-14	6.76	.90	.45	8.11	16.29	13.65	-
1	AA Double Strength Fertilizer 8-16-20	6.61	1.24	.39	8.24	16.17	18.50	-

4	AA Monarch Fertilizer 4-8-4	.	.	.	.	.	.	.	2.60	.59	1.02	4.21	7.84	4.00
1	AA Monarch Fertilizer 4-8-4	.	.	.	.	.	.	.	2.64	.40	.96	4.00	8.72	4.30
6	AA Monarch Fertilizer 4-8-4	.	.	.	.	.	.	.	2.76	.42	.95	4.13	8.42	3.93
4	AA Peerless Fertilizer 4-8-7	.	.	.	.	.	.	.	2.67	-	1.41	4.08	8.36	7.24
1	AA Peerless Fertilizer 4-8-7	.	.	.	.	.	.	.	2.81	.56	1.13	4.50	9.38	6.68
4	AA Potato Grower 5-8-10	.	.	.	.	.	.	.	3.54	.81	.75	5.10	8.63	10.17
2	AA Potato and Vegetable Fertilizer 5-8-7	.	.	.	.	.	.	.	3.27	.48	1.08	4.83	8.08	7.14
1	AA Potato and Vegetable Fertilizer 5-8-7	.	.	.	.	.	.	.	3.63	.59	.84	5.06	7.13	6.92
7	AA Potato and Vegetable Fertilizer 5-8-7	.	.	.	.	.	.	.	3.45	.42	.89	4.76	8.93	6.92
2	AA Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	.	1.34	.36	.84	2.54	8.07	9.66
4	AA Prolific 10% Potash Fertilizer 2-8-10	.	.	.	.	.	.	.	1.40	.17	.69	2.26	8.32	9.63
1	AA Tobacco Starter 5-5-15	.	.	.	.	.	.	.	3.21	.51	1.49	5.21	5.65	2.98
4	AA Top Dresser 7-6-6	.	.	.	.	.	.	.	5.30	.81	.91	7.02	6.44	6.20
5	AA Top Dresser 7-6-6	.	.	.	.	.	.	.	5.17	.77	.96	6.90	6.65	5.92
3	Agrieco for Aroostook with 10% Potash 5-8-10	.	.	.	.	.	.	.	3.41	.62	.87	4.90	8.40	10.08
5	Agrieco for Aroostook with 10% Potash 5-8-10	.	.	.	.	.	.	.	3.29	.68	.97	4.94	8.75	10.06
5	Agrieco for Corn 3-10-6	.	.	.	.	.	.	.	2.16	.03	.91	3.10	10.19	6.15
4	Agrieco for Corn 3-10-6	.	.	.	.	.	.	.	2.30	-	.79	3.09	11.30	6.36
4	Agrieco for Corn 4-12-6	.	.	.	.	.	.	.	2.21	.78	1.02	4.01	12.63	6.02
3	Agrieco Country Club Fertilizer 6-8-2	.	.	.	.	.	.	.	3.41	.32	2.46	6.19	8.16	2.17
2	Agrieco Country Club Fertilizer 8-5-2	.	.	.	.	.	.	.	3.67	1.17	3.67	8.51	5.76	2.16
3	Agrieco Country Club Fertilizer 8-6-4	.	.	.	.	.	.	.	6.52	.80	1.23	8.55	6.20	4.07
7	Agrieco for Fruit 9-6-6	.	.	.	.	.	.	.	7.31	.92	.60	8.83	6.64	6.08
3	Agrieco for Gardens 4-10-4	.	.	.	.	.	.	.	3.03	.10	1.18	4.31	11.07	4.26
2	Agrieco for Gardens 5-8-7	.	.	.	.	.	.	.	3.43	.83	.57	4.83	8.02	6.93
1	Agrieco for Lawns, Trees and Shrubs 7-6-6	.	.	.	.	.	.	.	4.83	1.10	1.16	7.09	8.07	4.90
2	Agrieco for Lawns, Trees and Shrubs 7-7-5	.	.	.	.	.	.	.	5.04	.50	1.94	7.48	7.25	5.19
6	Agrieco for Lawns, Trees and Shrubs 7-7-5	.	.	.	.	.	.	.	5.00	.83	1.40	7.23	7.91	5.08
4	Agrieco for New England 4-8-10	.	.	.	.	.	.	.	2.33	.75	.98	4.06	8.31	10.02
6	Agrieco for New England 4-8-10	.	.	.	.	.	.	.	2.57	.78	.80	4.15	8.88	9.67

## Mixtures Substantially Complying with Guarantees — Continued

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND				Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND	
		In Ammoniacal Forms	In Nitrate Forms	In Organic Forms	Total		As Muriate	In Forms Other than Muriate
American Agricultural Chemical Co. — concluded								
2	Agrico for Onions 5-10-5	2.79	.52	1.41	4.72	10.16	4.97	—
1	Agrico for Onions 5-10-5	2.66	.86	1.22	4.74	10.12	4.84	—
3	Agrico for Pastures and Top Dressing 7-6-6	5.34	.76	.81	6.91	6.40	6.38	—
8	Agrico for Pastures and Top Dressing 7-6-6	5.28	.71	.96	6.95	6.63	6.03	—
6	Agrico for Potatoes and Vegetables 5-8-7	3.48	.67	.88	5.03	8.43	7.06	—
4	Agrico for Potatoes and Vegetables 5-8-7	3.25	.62	.88	4.75	8.66	6.62	—
3	Agrico for Potatoes Double Strength 8-16-14	6.67	1.09	.33	8.09	16.65	14.05	—
2	Agrico for Potatoes Double Strength 8-16-20	6.71	.85	.59	8.15	17.71	20.48	—
3	Agrico for Potatoes Double Strength 8-16-20	6.52	1.22	.34	8.08	17.59	21.15	—
2	Agrico for Seeding Down 4-16-20	3.02	.97	.26	4.25	15.68	19.73	.20
1	Agrico for Seeding Down 4-16-20	3.01	.79	.48	4.28	16.55	17.86	—
3	Agrico for Tobacco 6-3-6	.63	.70	4.58	5.91	3.09	—	6.11
1	Agrico for Tobacco 6-3-6	.36	.59	5.04	5.99	2.99	—	5.72
3	Bowker's All Round Fertilizer 3-10-4	2.04	.11	.91	3.06	10.61	4.42	—
1	Bowker's All Round Fertilizer 3-10-4	2.24	.36	.90	3.50	10.13	4.11	—
2	Bowker's Market Garden Fertilizer 4-8-4	2.55	.50	.99	4.04	8.01	4.17	—
5	Bowker's Market Garden Fertilizer 4-8-4	2.75	.45	.85	4.05	8.58	4.26	—
2	Bowker's Stockbridge Early Crop Manure 5-8-7	3.46	.61	.87	4.94	8.11	7.11	—
5	Bowker's Stockbridge Early Crop Manure 5-8-7	3.67	.53	.92	5.12	8.49	7.02	—
2	Bowker's Stockbridge Potato and Vegetable Manure 4-8-10	2.58	.44	.98	4.00	8.26	9.73	.20
4	Bowker's Stockbridge Potato and Vegetable Manure 4-8-10	2.65	.68	.89	4.22	8.34	9.63	—
3	Bradley's Blood, Bone and Potash Brand 5-8-7	3.74	.32	1.08	5.14	8.09	7.05	—
3	Bradley's Blood, Bone and Potash Brand 5-8-7	3.66	.60	.73	4.99	8.01	6.67	—
4	Bradley's Complete Manure for Potatoes and Vegetables 4-8-7	2.71	.31	1.05	4.07	8.58	7.06	—

3	Bradley's Complete Manure with 10% Potash 4-8-10	2.57	.73	.87	4.17	8.53	10.15	-
3	Bradley's Northland Fertilizer 4-8-4	2.32	.62	1.16	4.10	8.38	4.23	-
1	Bradley's Northland Fertilizer 4-8-4	2.66	.28	.95	3.89	8.73	4.41	-
4	Bradley's XL Fertilizer 3-10-4	2.42	.31	.67	3.40	9.90	4.47	-
5	Bradley's XL Fertilizer 3-10-4	2.32	.41	.84	3.57	9.92	4.38	-
2	Co-Op 5-8-7 Fertilizer	3.45	.85	.91	5.21	8.43	6.80	.20
1	Co-Op 7-6-6 Fertilizer	5.01	.90	.79	6.70	6.82	6.40	-
1	Co-Op 8-16-14 Fertilizer	6.46	1.26	.47	8.19	16.96	14.00	-
1	National Pine Tree Brand 4-8-4	2.47	.41	1.17	4.05	8.20	4.14	-
1	Sanderson's Formula A 4-8-4	2.43	.88	.51	3.82	8.34	4.19	-
2	Sanderson's Formula B 4-8-7	2.92	.42	.77	4.11	8.29	.65	6.43
2	American Soda Products Co. Grogreen 3-8-3	2.38	.34	2.24	4.96	9.55	-	3.02
2	Apothecaries Hall Co. Liberty Corn 2-10-2	1.23	.25	1.05	2.53	10.23	2.76	-
1	Liberty Fertilizer 3-10-6	1.24	1.00	1.11	3.35	9.64	7.09	-
1	Liberty Fish, Bone and Potash 3-10-4	1.17	1.33	1.04	3.54	9.76	4.64	-
1	Liberty High Grade Corn 2-12-4	1.40	-	1.28	2.68	12.40	4.70	-
2	Liberty High Grade Market Gardeners 5-8-7	3.52	.80	.82	5.14	8.36	6.52	-
4	Liberty High Grade Market Gardeners 5-8-7	3.53	.87	.91	5.31	8.51	7.11	-
2	Liberty High Grade Market Gardeners (Special Formula) 5-8-7	3.09	1.10	1.19	5.38	8.53	7.29	-
1	Liberty High Grade Tobacco Manure 6-3-7	-	.59	5.72	6.31	4.64	-	7.09
2	Liberty Market Gardeners Special 4-8-4	3.28	.36	.81	4.45	8.67	5.02	-
2	Liberty Market Gardeners Special 4-8-4	2.98	.59	.72	4.29	8.41	4.21	-
2	Liberty Potato and General Crops 4-8-10	2.73	.94	.85	4.52	8.21	10.35	-
1	Liberty Potato and Market Gardeners (Potash as Muriate) 4-8-7	2.32	.81	.86	3.99	7.87	8.55	-
2	Liberty Potato and Market Gardeners (Potash as Muriate) 4-8-7	2.06	1.32	1.00	4.38	10.36	7.99	-
2	Liberty Special Fertilizer for Fruit 7-8-6	2.83	3.84	.65	7.32	8.01	6.28	-

## Mixtures Substantially Complying with Guarantees — Continued

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND				Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND	
		In Ammoniacal Forms	In Nitrate Forms	In Organic Forms	Total		As Muriate	In Forms Other than Muriate
	<b>Apothecaries Hall Co. — concluded</b>							
1	Liberty Special Fertilizer for Lawns, Etc. 4-4-0	-	.80	3.97	4.77	4.56	-	-
1	Liberty Tobacco Fertilizer 6-3-6	.60	.68	4.73	6.01	4.35	-	6.39
1	Liberty Tobacco Special 5-3-5	-	1.29	4.41	5.70	3.13	-	6.14
2	Liberty Top Dresser for Grass and Grain 8-8-8	1.76	6.23	.39	8.38	9.33	9.61	-
1	Liberty Top Dresser for Grass and Grain 8-8-8	1.35	6.24	.55	8.14	8.03	9.38	-
2	Liberty Tree and Shrub Food 10-8-8	7.77	1.99	1.07	10.83	7.91	10.02	-
1	Liberty 10-16-14	6.08	3.22	1.31	10.61	17.05	14.58	-
	<b>Armour Fertilizer Works</b>							
1	Armours Big Crop Fertilizer 2-10-2	1.29	.65	.71	2.65	10.03	2.83	-
1	Armours Big Crop Fertilizer 2-12-4	1.36	.34	.50	2.20	12.01	4.21	-
3	Armours Big Crop Fertilizer 3-10-4	2.06	.57	.66	3.29	10.11	4.42	-
3	Armours Big Crop Fertilizer 3-12-6	1.87	.41	1.07	3.35	11.92	6.38	-
2	Armours Big Crop Fertilizer 3-12-6	1.70	.42	.95	3.07	12.48	5.74	-
1	Armours Big Crop Fertilizer 3-12-6 (1936 stock)	1.71	.48	.74	2.93	12.28	5.95	-
5	Armours Big Crop Fertilizer 4-8-4	2.71	.70	.88	4.29	8.00	4.34	-
4	Armours Big Crop Fertilizer 4-8-4	2.51	.94	.82	4.27	8.37	4.33	-
5	Armours Big Crop Fertilizer 4-8-7	2.32	.74	1.07	4.13	8.05	7.11	-
1	Armours Big Crop Fertilizer 4-8-7	2.34	.76	1.16	4.26	8.05	6.93	-
5	Armours Big Crop Fertilizer 4-8-10	2.51	.68	1.07 <sup>a</sup>	4.26	8.05	10.09	-
2	Armours Big Crop Fertilizer 4-8-10	2.51	1.00	.77	4.28	8.06	10.29	-
2	Armours Big Crop Fertilizer 4-16-4	3.24	.58	.40	4.22	15.80	4.08	-
5	Armours Big Crop Fertilizer 5-8-7	3.17	1.08	.96	5.21	8.03	6.97	-
3	Armours Big Crop Fertilizer 5-8-7	3.10	1.40	.98	5.48	8.29	6.73	-

2	Armours Big Crop Fertilizer 5-8-10	3.11	.99	1.03	5.13	8.02	10.02	
3	Armours Big Crop Fertilizer 6-11-10	4.97	.81	.34	6.12	11.25	9.92	
3	Armours Big Crop Fertilizer 7-6-6	5.57	.57	.92	7.05	6.63	6.25	
1	Armours Big Crop Fertilizer 7-6-6	5.18	1.01	.99	7.13	6.74	6.00	
3	Armours Big Crop Fertilizer 8-16-14	6.76	.97	.37	8.10	16.32	14.04	
2	Armours Big Crop Fertilizer 8-16-20	6.62	1.25	.22	8.09	16.01	20.21	
2	Armours Big Crop Orchard Special 7-8-6	4.00	1.86	1.01	6.87	8.30	4.45	1.82
1	Armours Big Crop Tobacco Special 5-3-5	.14	1.42	3.85	5.41	3.24		5.14
2	Armours Big Crop Tobacco Special 6-3-6	.71	1.37	3.95	6.04	3.52		6.20
1	Armours Big Crop Tobacco Starter 5-5-15	2.10	1.89	1.61	5.60	6.21		15.59
4	Armours Fertilizer 4-8-8	2.53	.51	.95	3.99	8.17	8.05	
1	Armours Fertilizer 4-8-8	2.09	.90	1.17	4.16	8.07	8.37	
1	Armours Fertilizer 6-8-6	4.36	1.17	1.03	6.55	8.73	6.31	
3	Armours Fertilizer 8-16-16	6.86	.83	.35	8.05	16.22	15.85	
2	Armours Garden and Lawn Fertilizer 4-8-6	2.37	1.03	.83	4.23	8.31	6.70	
	<b>Atlantic States Fertilizer Co.</b>							
3	Baa Baa Reinforced Wool Waste-Sheep Manure 2.5-1.5-3.5	1.49	.09	2.07	3.65	1.81	2.37	89
3	Baa Baa Reinforced Wool Waste-Sheep Manure 2.5-1.5-3.5	1.63	.31	1.91	3.85	1.90	2.37	67
	<b>Barrie Laboratories, Inc.</b>							
2	Barrie's Plant Food 6-4-6	.12	1.07	5.84	7.03	7.88	4.10	2.78
	<b>F. A. Bartlett Tree Expert Co.</b>							
1	Bartlett Green Tree Food 6-7-4	4.31	.11	2.20	6.62	8.20	4.08	
	<b>Belmont Gardens</b>							
1	Belgard Plant Food 6-15-4	5.01	.46	1.06	6.53	17.41		3.65
	<b>Berkshire Chemical Co.</b>							
1	Berkshire Double Strength Fertilizer 8-16-14	5.83	1.89	.38	8.10	16.20	13.88	
1	Berkshire Golf Green Fertilizer 8-5-2	2.15	.37	5.67	8.19	5.81	2.12	
1	Berkshire Grass Special Fertilizer 6-6-5	4.08	.55	1.44	6.07	6.00	5.34	
2	Berkshire Grass Special Fertilizer 6-6-5	4.61	.24	1.48	6.33	6.77	5.18	

<sup>a</sup> The water insoluble nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Continued

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND			Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND		MAGNESIUM OXIDE	
		In Am- moniacal Forms	In Nitrate Forms	In Organic Forms		As Muriate	In Forms Other than Muriate	Found	Guaranteed
	<b>Berkshire Chemical Co. — concluded</b>								
1	Berkshire High Grade Tobacco Fertilizer 6-3-6 .	.24	.62	5.18	3.56	—	5.61		
1	Berkshire Long Island Special Fertilizer 4-8-7 .	1.88	.32	1.83	7.90	6.51	—		
5	Berkshire Long Island Special Fertilizer 4-8-7 .	2.53	.47	1.17	8.13	6.91	—		
1	Berkshire Market Garden Fertilizer 4-8-4 .	2.17	.23	1.78	8.05	4.11	—		
6	Berkshire Market Garden Fertilizer 4-8-4 .	2.53	.38	1.16	8.28	4.06	—		
1	Berkshire Union Special Fertilizer 4-10-4 .	2.52	.34	1.17	10.31	4.29	—		
4	Berkshire Onion Special Fertilizer 4-10-4 .	2.75	.24	1.03	10.26	3.99	—		
1	Berkshire 5-8-7 Potato and Garden Special .	2.23	.57	2.17	8.63	7.55	—		
5	Berkshire 5-8-7 Potato and Garden Special .	2.67	.95	1.34	8.10	7.03	—		
1	Berkshire Tobacco Special Fertilizer 7-3-7 .	.26	1.85	5.20	4.16	—	7.22		
1	Berkshire Tobacco Starter Fertilizer 5-5-15 .	.12	3.20	2.17	5.76	—	15.19		
1	Berkshire Truck 4-8-5 .	2.07	.27	1.94	7.51	4.63	—		
1	Berkshire Truck 4-8-5 .	2.29	.32	1.58	8.06	4.65	—		
	<b>Woodworth Bradley, Inc.</b>								
1	Golco 8-6-4 .	5.27	1.23	1.17	6.85	4.22	—		
	<b>Joseph Breck &amp; Sons Corp.</b>								
1	Breck's Home Garden Fertilizer 5-10-10 .	1.66	1.85	1.64	10.22	3.37	6.66		
1	Breck's Home Garden Fertilizer 5-10-10 .	1.65	1.79	1.63	10.42	4.30	6.35		
1	Brexone 5-10-4 Lawn and Plant Food .	2.01	1.67	1.63	10.47	3.56	1.23		
2	Brexone 5-10-4 Lawn and Plant Food .	2.35	1.45	1.79	10.67	3.31	.96		
1	Brexone Rose Food 4-12-4 .	1.76	1.34	1.26a	12.43	3.61	.86		
	<b>Clay &amp; Son, Ltd.</b>								
3	Clay's Fertilizer 5-9-2 .	2.49	.34	2.91	9.45	—	2.43		

Collins Seed Service Co.												
2	Casta-Poma Grass Manure 5-6-2	.	.	.	.	2.71	.33	2.08	5.12	6.33	2.35	-
2	Complete Grass Manure 6-8-2	.	.	.	.	2.95	1.20	2.47	6.62	8.55	3.31	-
1	General Purpose Manure 4-8-4	.	.	.	.	2.01	1.01	1.22	4.24	8.61	4.32	-
2	Ver-Best P. G. Manure 7-8-3	.	.	.	.	3.50	1.11	2.59	7.20	8.47	3.14	-
Consolidated Rendering Co.												
2	Competitive Brand 4-8-8	.	.	.	.	3.48	.48	.11	4.07	8.58	8.25	-
2	Competitive Brand 6-8-6	.	.	.	.	4.88	.58	.44	5.90	8.75	6.03	-
1	Competitive Brand 8-16-16	.	.	.	.	6.49	.98	.33	7.80	16.95	17.84	-
5	Corenco 3-10-4 Animal Brand	.	.	.	.	1.09	1.14	1.04	3.27	10.62	4.17	.44
4	Corenco 3-10-4 Animal Brand	.	.	.	.	1.16	.96	.99	3.11	9.98	4.25	-
7	Corenco 4-8-4	.	.	.	.	2.06	1.11	1.00	4.17	8.41	4.39	-
3	Corenco 4-8-4	.	.	.	.	2.11	1.16	.96	4.23	8.02	4.14	-
3	Corenco 4-8-7 Market Garden	.	.	.	.	2.37	.85	1.01	4.23	9.02	7.41	-
2	Corenco 4-8-7 Market Garden	.	.	.	.	2.30	.86	.93	4.09	7.99	7.36	-
6	Corenco 4-8-10 Potato Grower	.	.	.	.	2.07	1.11	1.16	4.34	8.21	10.50	-
1	Corenco 4-8-10 Potato Grower	.	.	.	.	1.69	1.14	1.33	4.16	8.48	9.97	-
1	Corenco 4-8-10 Potato Grower	.	.	.	.	2.01	.97	1.02	4.00	8.12	10.37	-
1	Corenco 4-10-4 Complete Onion and Corn	.	.	.	.	2.13	1.03	1.06	4.22	10.15	4.09	-
3	Corenco 4-12-4 Complete Manure	.	.	.	.	2.21	1.01	.84	4.06	12.51	4.35	-
2	Corenco 5-5-5 Lawn and Shrub Fertilizer	.	.	.	.	2.19	.17	2.81	5.17	6.27	5.62	-
6	Corenco 5-8-7 General Crop Manure	.	.	.	.	3.16	1.04	* 1.06	5.28	8.53	7.39	-
5	Corenco 5-8-7 General Crop Manure	.	.	.	.	3.04	1.04	.99	5.07	8.36	7.27	-
3	Corenco 5-8-7 Made with Water Soluble Magnesium	.	.	.	.	2.93	.92	1.29	5.14	8.71	7.56	1.00
5	Corenco 5-8-10 Peerless Potato	.	.	.	.	3.13	.98	1.02	5.13	8.53	10.21	-
4	Corenco 5-8-10 Peerless Potato	.	.	.	.	3.06	.88	1.02	4.96	8.27	10.10	-
2	Corenco 5-8-10 Made with Water Soluble Magnesium	.	.	.	.	3.02	1.00	.97	4.99	8.31	10.11	1.00
1	Corenco 5-9-8	.	.	.	.	2.21	1.15	1.82	5.18	9.09	8.25	-

<sup>a</sup> The water insoluble nitrogen was of inferior quality.



## Mixtures Substantially Complying with Guarantees — Continued

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND			Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND		MAGNESIUM OXIDE	
		In Am- moniacal Forms	In Nitrate Forms	In Organic Forms		As Muriate	In Forms Other than Muriate	Found	Guaranteed
1	Consolidated Rendering Co. — concluded	3.28	1.03	.79	10.42	5.30	—		
2	Corenco 5-10-5 High Grade Onion	.58	1.11	4.50	4.35	—	6.85		
2	Corenco 6-3-6 Special Tobacco Grower	.52	3.47	3.26	4.29	—	7.96		
6	Corenco 7-3-7 Super Tobacco Grower	4.71	1.13	1.39	6.55	6.29	—		
2	Corenco 7-6-6 Complete Fruit and Top Dressing	5.05	1.20	.96	6.51	5.74	—		
2	Corenco 8-6-4 Top Dressing	5.94	1.39	.76	6.16	4.26	—		
4	Corenco 8-16-14 Two in One	5.97	1.13	1.29	17.35	13.68	—		
1	Corenco 8-16-14 Two in One Made with Water Soluble Magnesium	4.61	2.09	1.26	16.79	13.61	—	2.26	2.00
1	Corenco 10-6-4	7.92	1.04	.68	6.28	4.60	—		
1	Corenco 10-6-4	8.15	1.07	.52	6.07	4.04	—		
1	Corenco 10-6-4	5.44	.11	4.48	6.09	3.82	.91		
5	New England 8-6-2 Putting Green Special	4.62	.91	2.93	6.96	2.28	—		
1	New England 8-6-2 Putting Green Spec. 1.	3.21	1.88	2.74	7.04	2.13	—		
1	Davey Tree Expert Co. Davey Tree Food 10-3-3	3.01	1.82	6.07	3.23	2.24	1.17		
1	Davison Chemical Corp. Davco Homogeneous Granulated 5-8-7 Fertilizer	4.32	.24	.67	8.86	7.27	—		
1	Davco Homogeneous Granulated 6-6-5 Fertilizer	5.27	.34	.17	5.99	5.40	—		
4	Eastern States Farmers' Exchange Eastern States 0-20-20	—	—	—	20.62	20.80	—	1.77	1.60
5	Eastern States 4-8-8	2.70	.94	.75	8.95	6.37	2.60	3.59	8.00
3	Eastern States 4-8-8	2.89	.78	.79	8.39	8.71	—	3.55	3.00

7	Eastern States 4-12-4	.	.	.	.	.	.	.	.	2.96	1.02	.46	4.44	12.60	4.71	-	2.42	2.00
2	Eastern States 4-12-4	.	.	.	.	.	.	.	.	2.84	.90	.61	4.35	12.03	4.33	-	2.62	2.00
5	Eastern States 4-16-20	.	.	.	.	.	.	.	.	3.02	.95	.36	4.33	16.69	21.39	-	2.38	1.80
1	Eastern States 4-16-20	.	.	.	.	.	.	.	.	2.82	1.05	.44	4.31	15.17	22.91	-	2.79	1.80
2	Eastern States 5-5-15 Tobacco	.	.	.	.	.	.	.	.	.22	2.44	2.90	5.56	5.32	-	18.69	2.91	2.70
1	Eastern States 6-3-6 Cranberry	.	.	.	.	.	.	.	.	.22	6.03	.43	6.68	4.30	-	6.14	-	-
6	Eastern States 6-8-6	.	.	.	.	.	.	.	.	4.03	1.73	.60	6.36	8.73	6.77	-	3.54	3.00
2	Eastern States 6-8-6	.	.	.	.	.	.	.	.	3.84	1.98	.57	6.39	7.86	6.67	-	3.40	8.00
2	Eastern States 8-4-8 Tobacco	.	.	.	.	.	.	.	.	2.22	3.31	3.07	8.60	4.31	-	8.43	3.58	3.30
3	Eastern States 8-12-20	.	.	.	.	.	.	.	.	5.85	1.96	.34	8.15	12.71	16.67	4.00	1.80	1.60
3	Eastern States 8-12-20	.	.	.	.	.	.	.	.	5.62	2.13	.33	8.08	13.23	15.98	4.03	2.08	1.60
7	Eastern States 8-16-16	.	.	.	.	.	.	.	.	5.96	2.04	.30	8.30	16.85	12.32	4.13	2.00	1.60
1	Eastern States 8-16-16	.	.	.	.	.	.	.	.	5.85	2.13	.35	8.39	14.47	20.17	2.99	2.20	1.60
2	Eastern States 8-16-16	.	.	.	.	.	.	.	.	5.69	1.83	.46	7.98	17.04	12.71	3.16	2.12	1.60
2	Eastern States 8-16-16 Low Chlorine Special	.	.	.	.	.	.	.	.	2.93	1.98	3.31	8.22	15.60	-	17.85	2.32	1.60
3	Eastern States 8-20-12	.	.	.	.	.	.	.	.	5.50	2.20	.49	8.19	20.69	9.98	2.90	2.18	1.60
1	Eastern States 8-20-12	.	.	.	.	.	.	.	.	5.30	2.11	.70	8.11	20.30	10.11	2.52	2.33	1.60
5	Eastern States 8-24-8	.	.	.	.	.	.	.	.	4.94	2.99	.51	8.44	25.21	8.57	-	2.18	1.60
1	Eastern States 8-24-8	.	.	.	.	.	.	.	.	4.52	2.89	.61	8.02	22.62	10.17	-	2.34	1.60
2	Eastern States 8-24-8	.	.	.	.	.	.	.	.	4.62	3.19	.39	8.20	24.00	8.32	-	2.10	1.60
2	Eastern States 10-5-10 Tobacco	.	.	.	.	.	.	.	.	.38	1.94	7.87	10.19	5.05	-	11.50	3.15	2.80
4	Eastern States 12-4-4	.	.	.	.	.	.	.	.	7.90	4.05	.40	12.35	4.56	4.47	-	3.68	3.50
1	Eastern States 12-4-4	.	.	.	.	.	.	.	.	7.72	4.01	.38 <sub>a</sub>	12.11	4.10	4.84	-	3.55	3.50
1	Eastern States 12-16-12	.	.	.	.	.	.	.	.	7.89	3.78	.54	12.21	16.06	-	12.53	2.09	1.60
4	Eastern States 12-16-12	.	.	.	.	.	.	.	.	7.91	3.81	.48	12.20	16.18	1.35	11.69	2.16	1.60
2	Eastern States 12-16-12	.	.	.	.	.	.	.	.	7.50	3.92	.63	12.05	19.07	-	11.85	1.80	1.60
2	Thomas W. Emerson Co. English Formula Lawn and Garden Dressing 5-7-3	.	.	.	.	.	.	.	.	3.03	.07	2.38	5.48	8.13	3.28	-	-	-
2	English Formula Lawn and Garden Dressing 5-7-3	.	.	.	.	.	.	.	.	2.70	.14	2.33	5.17	8.83	3.61	-	-	-
2	Excell Laboratories "New Plant Life" 1.4-1.07-.54	.	.	.	.	.	.	.	.	.68	.06	1.02	1.76	.84	-	1.55	-	-

<sup>a</sup> The water insoluble nitrogen was of inferior quality.

## Mixtures Substantially Complying with Guarantees — Continued

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND				Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND		MAGNESIUM OXIDE	
		In Am- moniacal Forms	In Nitrate Forms	In Organic Forms	Total		As Muriate	In Forms Other than Muriate	Found	Guaranteed
1	Flower City Charcoal Co. Char-Top 1-4-1 . . . . .	1.48	—	.63	2.11	5.42	1.69	—		
1	Flower City Plant Food Co., Inc. Wondergro Plant Food Tablet Form 10-12-11 . . . . .	10.43	4.94	.17	15.54	18.52	—	15.83		
1	H. L. Frost & Higgins Co. Frost's Lawn and Shrubbery Special 8-6-3 . . . . .	2.55	1.73	3.87	8.15	6.43	3.34	—		
1	Frost's Lawn and Shrubbery Special 8-6-3 . . . . .	2.59	1.64	3.84	8.07	6.37	3.33	—		
2	Garden Hose Spray Co., Inc. Arnold Balanced Fertilizer 10-18-12 . . . . .	.06	10.40	.05	10.51	18.02	—	11.72		
1	Goulard & Olena, Inc. G & O Lawn Garden and Flower Fertilizer 5-8-5 . . . . .	3.50	.72	.87	5.09	8.46	4.38	—		
1	G & O Lawn Garden and Flower Fertilizer 5-8-5 . . . . .	3.26	.36	1.25	4.87	7.89	5.25	—		
2	Sears Lawn and Garden Grower 4-8-3 . . . . .	3.01	.47	.98	4.46	8.92	3.46	—		
1	Thomas J. Grey Co. Grey's 9-6-6 Plant Food . . . . .	7.52	1.07	.45	9.04	6.45	6.05	—		
2	Allen Hersom Co. Neverfail 4-8-4 . . . . .	2.13	.94	1.04	4.11	7.99	4.22	—		
3	Neverfail 5-8-7 . . . . .	3.15	.94	1.00	5.09	8.30	7.08	—		
1	A. H. Hoffman, Inc. Hoffman's Plant Food 5-8-6 . . . . .	1.67	1.57	1.98	5.22	10.38	.58	5.58		
1	Hoffman's Plant Food 5-8-6 . . . . .	1.89	1.49	1.74	5.12	13.19	—	6.10		
1	International Agricultural Corp. Breck's Special 10-6-4 . . . . .	7.52	1.59	1.50	10.61	6.51	4.50	—		
4	International 3-10-4 . . . . .	1.64	.79	.72	3.15	10.37	4.34	—		
2	International 3-10-4 . . . . .	2.04	.67	.46	3.17	10.51	4.33	—		



## Mixtures Substantially Complying with Guarantees — Continued

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND				Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND	
		In Ammoniacal Forms	In Nitrate Forms	In Organic Forms	Total		As Muriate	In Forms Other than Muriate
2	Lowell Fertilizer Co. Lowell 4-8-4 Corn and Vegetable . . . . .	1.98	1.18	.98	4.14	8.28	4.32	-
2	Lowell 5-8-7 Market Garden Manure . . . . .	2.86	1.25	1.01	5.12	8.24	7.23	-
1	Lowell 5-8-10 Aroostook Special for Potatoes . . . . .	2.10	1.29	1.95	5.34	8.25	10.11	-
1	Lowell 5-8-10 Aroostook Special for Potatoes . . . . .	3.07	1.14	.97	5.18	8.59	10.14	-
2	Lowell 7-6-6 Complete Fruit and Top Dressing . . . . .	4.50	1.08	1.18	6.76	6.80	5.89	-
1	McClain Brothers Co. Veg-E-Tonic 21-13-10 . . . . .	11.02	1.16	10.69	22.87	14.15	9.87	-
1	Master Meat Products Co. Master Bone Meal Fertilizer 4-12-2 . . . . .	1.20	-	3.15	4.36	5.68c	2.45	-
2	New England Toro Co. Netco Greens Formula 8-6-2 . . . . .	6.11	.20	2.52	8.83	6.40	3.02	-
3	Netco Greens Formula 8-6-2 . . . . .	5.43	.38	2.65	8.46	6.39	2.78	-
1	Old Deerfield Fertilizer Co., Inc. Old Deerfield Complete 5-3-5 . . . . .	.10	1.35	4.19	5.64	4.81	-	6.15
4	Old Deerfield Complete Tobacco 6-3-7 . . . . .	1.04	.65	4.86	6.55	3.10	-	8.19
2	Old Deerfield Complete Tobacco 6-3-7 . . . . .	.71	.66	5.17	6.54	4.29	-	8.22
1	Old Deerfield Concentrated 8-16-20 (Potash other than Muriate) <sup>b</sup> . . . . .	3.35	.85	3.76	7.96	16.04	14.27	4.83
4	Old Deerfield Corn and Seeding Down 3-10-6 . . . . .	1.68	-	1.52	3.20	10.68	6.54	-
2	Old Deerfield General Crop 4-8-4 . . . . .	1.44	.70	2.10	4.24	8.66	4.27	-
3	Old Deerfield Grass Top Dressing 7-6-6 . . . . .	3.09	3.27	.99	7.35	6.59	3.11	3.14
2	Old Deerfield Grass Top Dressing 7-6-6 . . . . .	3.08	3.26	.91	7.25	6.84	3.16	3.34

3	Old Deerfield High Potash 4-8-10	1.53	.77	2.11	4.41	8.99	7.97	2.68
2	Old Deerfield High Potash 4-8-10	1.66	.60	2.17	4.43	8.86	7.92	2.89
1	Old Deerfield Lawnsrub 5-5-5	1.49	.75	3.79	6.03	7.45	5.27	.36
1	Old Deerfield Lawnsrub 5-5-5	1.87	.74	3.58	6.19	6.90	5.24	.52
3	Old Deerfield Union 5-8-7	1.64	.73	3.16	5.53	9.04	6.61	1.04
2	Old Deerfield Union 5-8-7	2.07	.91	2.32	5.30	8.82	7.60	-
4	Old Deerfield Potato 4-8-7	1.75	1.02	1.76	4.53	8.70	4.45	2.99
2	Old Deerfield Potato (Potash other than Muriate) 4-8-7	1.71	.91	1.79	4.41	9.04	-	7.60
1	Old Deerfield Set Onion 5-8-7 (Potash other than Muriate)	2.30	.84	2.34	5.48	8.68	-	7.43
2	Old Deerfield Starter Bone and Potash 5-8-12	.67	.53	4.20	5.40	8.23	-	13.49
1	Old Deerfield 4-6-10	1.39	1.10	1.79	4.28	6.15	1.20	9.08
2	Old Deerfield 5-8-10	2.14	.99	2.70	5.83	8.63	10.07	-
4	Old Deerfield 8-16-14	3.32	3.54	1.35	8.22	16.31	8.29	7.05
1	Valley Brand 2-8-10	.81	.65	.83	2.29	8.58	10.63	-
2	Valley Brand 4-8-4	1.92	1.53	.77	4.22	8.45	4.99	-
3	Valley Brand 4-8-7	2.01	1.41	.93	4.35	9.01	5.81	1.75
2	Valley Brand 5-8-7	2.30	2.36	.75	5.41	8.38	5.73	2.18
1	Valley Brand 8-16-14	6.23	.81	1.56	8.60	16.20	14.73	-
	<b>Olds &amp; Whipple, Inc.</b>							
1	"Luxura" 5-8-6	2.34	.51	2.67	5.52	10.13	6.34	-
3	O & W Blue Label Tobacco Fertilizer 6-3-6	.14	.94	5.16	6.24	2.32	-	6.37
3	O & W Blue Label Tobacco Fertilizer 6-3-6	.30	.93	5.03	6.26	3.58	-	6.95
2	O & W Complete Tobacco Fertilizer 5-3-5	.16	1.02	4.13	5.31	2.64	-	5.91
1	O & W Corn Fertilizer 3-10-4	1.87	.90	1.13	3.90	9.86	4.42	-
3	O & W Market Garden Fertilizer 4-8-4	2.62	1.07	.87	4.56	8.36	4.63	-
1	O & W 4-8-4 Market Garden with Sulphate	2.55	.70	.97	4.22	8.19	.91	3.36

<sup>c</sup> Total phosphoric acid, 13.10 %, evidently derived from ground bone.

<sup>b</sup> One other sample was deficient: see analysis in table of "Mixtures showing a commercial shortage of \$1 or more per ton."

## Mixtures Substantially Complying with Guarantees — Continued

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND				Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND	
		In Ammoniacal Forms	In Nitrate Forms	In Organic Forms	Total		As Muriate	In Forms Other than Muriate
	<b>Olds &amp; Whipple, Inc. — concluded</b>							
2	O & W Potato and General Purpose Fertilizer 4-8-7	3.01	.54	.85	4.40	8.35	7.48	—
1	O & W Potato and General Purpose Fertilizer 4-8-7	3.04	.65	.67	4.36	8.30	7.84	—
3	O & W Potato and General Purpose Fertilizer 5-8-7	3.80	.89	.78	5.47	8.56	6.68	.96
2	O & W Potato and General Purpose Fertilizer 5-8-7	3.58	.89	.84	5.31	8.01	7.90	—
2	O & W Special Fertilizer 4-3-12	.22	1.25	3.14	4.61	5.44	—	14.44
1	O & W Special Fertilizer 4-3-12	.11	.62	3.51	4.24	5.51	—	13.82
2	O & W Top Dressing and Grass Fertilizer 8-6-6	3.57	3.78	.92	8.27	6.68	6.45	—
1	O & W Top Dressing and Grass Fertilizer 8-6-6	3.74	3.97	.53	8.24	6.28	6.62	—
1	O & W Fertilizer 4-10-4	2.48	.75	1.07	4.30	10.19	4.48	—
1	O & W 5-4-15 High Grade Tobacco Starter & Potash Compound	1.50	1.88	1.76	5.14	4.76	—	15.47
2	O & W 8-16-14 Fertilizer	4.85	2.51	.99	8.35	16.53	11.20	4.05
	<b>Organic Fertilizer Corp.</b>							
2	Fish Organo 4-3-1	.26	.23	3.26a	3.75	2.49	—	1.68
4	Fish Organo 4-3-1	.52	.16	3.56a	4.24	2.95	—	1.52
1	Fish Organo 4-3-1	.82	.14	3.10a	4.06	3.73	—	1.62
2	<b>F. G. Phillips Co.</b>							
	Ferti-Flora 3-3-3	1.43	2.01	—	3.44	3.15	—	3.66
	<b>Plantabbs Corp.</b>							
2	Fulton's Plantabbs 11-15-20	3.61	7.60	.18	11.39	19.46	—	26.33
3	<b>Plantspur Products Co., Inc.</b>							
1	Plantspur Fertilizer 3-3-2	2.91	.52	.28	3.71	2.98	2.22	—
	Plantspur Fertilizer 3-3-2	3.56	.50	.36	4.42	3.14	1.23	—
1	<b>Rogers &amp; Hubbard Co.</b>							
	Alsop Special Fertilizer 6-4-15	.10	1.38	4.86	6.34	5.86	—	16.01
1	Cranberry Special 5-6-4	2.77	.85	1.51	5.13	6.60	4.04	—

2	Gro-Fast Plant Food 5-6-6	1.27	—	4.01	5.28	6.08	6.04
2	Hubbard's All Soils All Crops Fertilizer 4-8-4	2.18	.50	1.65	4.33	8.17	5.82
2	Hubbard's All Soils All Crops Fertilizer 4-8-4	1.96	.48	1.64	4.08	8.50	4.49
2	Hubbard's "B.B." Fertilizer for Seeding Down 3-7-6	2.00	.24	1.01	3.25	9.96	6.06
4	Hubbard's "B.B." Oats and Top Dressing 8-5-8	.16	7.45	.42	8.03	7.38	1.81
5	Hubbard's "B.B." Oats and Top Dressing 8-5-8	.10	7.04	.91	8.05	6.75	1.34
4	Hubbard's "B.B." Soluble Corn and Market Garden Manure 4-8-7	1.95	.74	1.45	4.14	8.33	7.66
2	Hubbard's "B.B." Soluble Corn and Market Garden Manure 4-8-7	1.88	.72	1.55	4.15	8.15	7.56
3	Hubbard's "B.B." Soluble Potato Manure 5-8-7	1.91	1.23	2.02	5.16	9.40	7.56
1	Hubbard's "B.B." Soluble Tobacco Manure 5-8-10	.54	2.17	2.61	5.32	8.43	—
1	Hubbard's Climax Tobacco Brand 5-3-5	.12	.44	4.61	5.17	2.68	5.67
3	Hubbard's Corn and Grain Fertilizer 2-12-4	1.44	.18	.61	2.23	11.93	4.74
2	Hubbard's Golf Course Fertilizer 8-6-2	1.65	.25	6.69	8.59	7.05	1.53
3	Hubbard's High Potash Fertilizer 2-8-10	1.19	.21	.83	2.23	8.10	10.67
1	Hubbard's High Potash Fertilizer 2-8-10	.94	.22	1.02 <sub>a</sub>	2.18	8.66	10.44
3	Hubbard's Potato Fertilizer 5-8-7	2.47	.43	2.29	5.19	8.20	7.46
4	Hubbard's Potato Fertilizer 5-8-7	2.36	.36	2.63	5.35	7.46	7.35
2	Hubbard's Special 5-8-7 Fertilizer	1.89	1.42	1.76	5.07	8.95	7.87
2	Hubbard's Tobacco Grower-Vegetable Formula 6-3-6	.16	.83	5.06	6.05	2.40	6.92
2	Hubbard's Tobacco Grower-Vegetable Formula 6-3-6	.24	1.09	5.05	6.38	3.85	6.93
1	Hubbard's Tobacco Starter 5-4-15	.30	2.14	2.44	4.88	4.16	—
1	Hubbard's Tobacco Starter 5-4-15	.14	2.10	2.88	5.12	3.91	—
3	Red H 4-6-10	2.65	.63	.93	4.21	6.27	10.46
4	Red H 4-8-4	2.94	.77	.57	4.28	8.05	4.38
5	Red H 4-8-4	2.93	.94	.62	4.49	8.25	4.55
3	Red H 4-8-7	2.95	.69	.63	4.27	8.26	7.38
2	Red H 4-8-10	2.67	.65	.95	4.27	8.42	10.72
1	Red H 4-8-10	2.71	.94	.77	4.42	8.15	10.58

a The water insoluble nitrogen was of inferior quality.



## Mixtures Substantially Complying with Guarantees — Concluded

Num- ber of Sam- ples	NAME OF MANUFACTURER AND BRAND	NITROGEN FOUND				Available Phosphoric Acid Found	POTASH (K <sub>2</sub> O) FOUND	
		In Ammoniacal Forms	In Nitrate Forms	In Organic Forms	Total		As Muriate	In Forms Other than Muriate
	<b>Rogers &amp; Hubbard Co. — concluded</b>							
7	Red H 5-8-7	3.45	.50	1.32	5.27	8.15	7.27	—
5	Red H 5-8-7	3.62	.90	1.01	5.53	7.85	7.25	—
1	Red H 5-8-10 Fertilizer	3.96	1.02	.43	5.41	8.33	10.32	—
4	Red H 7-6-6	5.64	.70	.66	7.00	6.97	6.29	—
4	Red H 7-6-6	5.45	1.37	.53	7.35	6.78	6.26	—
3	Red H 8-16-14	6.57	.88	.81	8.26	15.83	12.52	.74
2	Red H 8-16-14	6.32	.81	1.14	8.27	15.83	15.42	—
3	<b>Salem Chemical &amp; Supply Co.</b>							
	Plant Food 3-4-3	2.25	.27	1.25	3.77	5.08	4.39	—
2	<b>O. M. Scott &amp; Sons Co.</b>							
	Scott's Turf Builder 10-6-4	6.26	.57	3.75	10.58	4.94	3.48	1.32
	<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b>							
1	Standard 3-8-4	2.43	.05	.85	3.33	10.00	2.71	1.99
1	Standard 3-10-4	2.00	.08	.53	2.61	9.61	2.84	1.80
1	Standard 4-6-10	2.94	.14	.95	4.03	8.29	7.13	2.96
2	Standard 4-8-4	2.62	.46	.90	3.98	8.07	4.51	—
2	Standard 4-8-4	2.66	.43	.94	4.03	8.36	4.49	—
2	Standard 4-8-7	2.72	.41	.84	3.97	7.78	6.32	2.49
1	Standard 4-8-7	3.07	.26	.90	4.23	8.34	3.64	3.35
2	Standard 4-8-10	2.93	.48	.85	4.26	8.04	7.32	2.13
2	Standard 5-8-7	3.32	.24	1.05	4.61	8.30	5.65	1.75
1	Standard 5-8-7	3.59	.45	.93 <sub>a</sub>	4.97	7.75	5.03	3.08
2	Standard Special Tobacco Fertilizer 6-3-7	.18	1.07	5.01	6.26	5.13	—	8.23
1	Standard 7-6-6	3.90	.73	1.82	6.45	6.39	6.62	—

[illegible]

a The water insoluble nitrogen was of inferior quality.

## CHEMICALS AND RAW PRODUCTS

## Summary of Results of the Inspection of Fertilizer Samples and Raw Products

MATERIAL	Number of Samples Collected	Number of Analyses Made	Average Percentage of Nitrogen	Average Percentage of Total Phosphoric Acid	Average Percentage of Available Phosphoric Acid	Average Percentage of Water Soluble Potash	Average Selling Price Per Ton	Average Commercial Valuation per Ton	Cost of One Pound of Plant Food (Cents)
Nitrate of soda	49	13	16.00 <sup>a</sup>	—	—	—	\$36.10	\$33.60	11.28 (nitrogen)
Nitrate of potash	6	3	13.10 <sup>b</sup>	—	—	44.24	59.15	54.06	11.49 (nitrogen) 3.28 (potash)
Nitrate of soda-potash	5	2	14.78 <sup>c</sup>	—	—	14.81	43.36	39.90	11.41 (nitrogen) 3.26 (potash)
Nitrate of lime	1	1	15.96 <sup>d</sup>	—	—	—	37.85	33.52	11.85 (nitrogen)
Cal-Nitro	8	3	20.81	—	—	—	39.43	43.70	9.47 (nitrogen)
Ammonium sulfate	54	16	20.64	—	—	—	37.63	33.44	9.12 (nitrogen)
Synthetic urea	4	2	46.29	—	—	—	110.60	106.47	11.95 (nitrogen)
Cyanamid	5	3	21.68	—	—	—	36.99	33.82	8.53 (nitrogen)
Ammo-Phos A	5	1	11.20	49.87	48.85	—	62.30	67.32	7.50 (nitrogen) 4.63 (available phosphoric acid)
Ammo-Phos B	1	1	16.15	22.94	21.89	—	54.00	48.39	9.04 (nitrogen) 5.58 (available phosphoric acid)
Cottonseed meal	48	48	6.65	2.56	—	1.77 <sup>e</sup>	42.03	38.57 <sup>f</sup>	31.60 (nitrogen)
Castor pomace	9	9	5.93	1.98	—	1.13 <sup>e</sup>	24.15	34.39 <sup>f</sup>	20.37 (nitrogen)
Cottonseed meal-castor pomace mixture	10	10	6.64	2.92	—	1.72 <sup>e</sup>	38.04	38.54 <sup>f</sup>	28.64 (nitrogen)
Linseed meal	2	2	5.23	1.95	—	1.68 <sup>e</sup>	40.00	30.33 <sup>f</sup>	38.24 (nitrogen)
Dried blood	5	3	10.94	2.96	—	—	117.96	63.94	50.73 (nitrogen)
Milorganite	6	1	6.04	2.71	—	—	31.48	32.04	24.07 (nitrogen)
Superphosphate 16%	69	15	—	17.00	16.48	—	15.55	16.65	4.67 (available phosphoric acid)
Superphosphate 20%	29	10	—	21.26	20.74	—	19.04	20.91	4.55 (available phosphoric acid)
Superphosphate 40%	6	2	—	42.48	40.84	—	36.00	41.36	4.35 (available phosphoric acid)
Basic slag phosphate	2	1	—	17.41	15.90	—	28.80	19.56	8.83 (available phosphoric acid)
Precipitated bone	2	2	—	41.37	39.30	—	40.60	38.00	5.08 (available phosphoric acid)
Muriate of potash	53	16	—	—	—	59.60	38.63	35.76	3.24 (potash)
High grade sulfate of potash	13	9	—	—	—	49.78	43.08	44.80	4.33 (potash)
Potash-magnesia sulfate	3	3	—	—	—	29.56 <sup>g</sup>	34.09	33.70	4.50 (potash) 2.82 (water soluble magnesium oxide)
Cotton hull ashes	6	6	—	3.09	—	26.79 <sup>h</sup>	39.25	40.62	6.47 (potash)
Wood ashes	6	6	—	1.66	—	4.01 <sup>i</sup>	19.40	11.99	16.18 (potash)
Dry ground fish	20	14	9.70	7.36 <sup>j</sup>	—	—	68.40	69.67	31.91 (nitrogen) 4.42 (phosphoric acid)
Animal tankage	33	27	9.16	8.82 <sup>k</sup>	—	—	69.23	55.61	32.87 (nitrogen) 5.10 (phosphoric acid)
Ground bone	96	25	2.71	25.11 <sup>l</sup>	—	—	38.87	37.10	30.19 (nitrogen) 4.48 (phosphoric acid)
Ground tobacco stems	1	1	1.51	.66	—	4.34	17.00	12.30	—
Pulverized sheep manure	53	18	1.61	1.10 <sup>m</sup>	—	3.43 <sup>e</sup>	40.95	10.48	—
Pulverized sheep and goat manure	18	4	1.48	1.69 <sup>m</sup>	—	3.73 <sup>e</sup>	34.28	10.54	—
Pulverized cattle manure	21	8	2.07	1.32 <sup>m</sup>	—	2.35 <sup>e</sup>	50.51	11.96	—
Pulverized poultry manure	10	2	5.05	2.22 <sup>m</sup>	—	1.13 <sup>e</sup>	50.37	25.19	—
Pulverized poultry manure and peat	4	4	2.42	2.76 <sup>m</sup>	—	1.49 <sup>e</sup>	40.00	14.00	—

a Average percentage of chlorine, .37%.

b Average percentage of chlorine, .36%.

c Average percentage of chlorine, .49%.

d Percentage of chlorine, .16%.

e Total potash.

f Not counting value of phosphoric acid or potash.

g Magnesium oxide, 13.26%; chlorine, 1.08%.

h Calcium oxide, 13.87%; magnesium oxide, 5.33%; moisture, 5.12%; insoluble matter, 17.63%.

i Calcium oxide, 29.36%; magnesium oxide, 3.56%; moisture, 24.55%; insoluble matter, 8.00%.

j Chlorine, .44%.

k Average tankage finer than 1/50 inch, 43.57%; coarser than 1/50 inch, 56.43%.

l Average bone finer than 1/50 inch, 70.12%; coarser than 1/50 inch, 29.88%.

m Average organic matter: sheep manure, 43.16%; sheep and goat manure, 33.80%; cattle manure 64.95%; poultry manure, 65.80%; poultry manure and peat, 51.13%.

Note: The average pound cost of nitrogen, phosphoric acid, and potash from all of the pulverized natural manures taken collectively would be as follows: nitrogen, 70 cents; phosphoric acid, 12 cents; potash, 11 cents.

## Nitrogen Compounds

The chemicals and unmixed materials under this heading are valued chiefly for the nitrogen which they contain. Some of them, however, contain more than this one element; the nitrate of potash containing potash; the calcium nitrate and cyanamid containing lime; and the organic vegetable substances containing small quantities of phosphoric acid and potash, as will be noticed by a reference to the summary table on the previous page.

Brands showing a commercial shortage of one dollar or more per ton are listed by themselves, serious deficiencies being emphasized by boldface type.

## Sulfate of Ammonia and Nitrate of Soda

MANUFACTURER	SULFATE OF AMMONIA			NITRATE OF SODA			
	Number of Samples	NITROGEN		Number of Samples	NITROGEN		CHLORINE Found
		Found	Guaranteed		Found	Guaranteed	
American Agricultural Chemical Co.	5	20.63	20.50	—	—	—	—
	1	20.58	20.50	—	—	—	—
	3	20.66	20.50	—	—	—	—
Apothecaries Hall Co.	2	20.85	20.50	—	—	—	—
Armour Fertilizer Works	1	20.70	20.50	—	—	—	—
Barrett Co.	8	20.72	20.56	6	16.18	16.00	.22
	4	20.70	20.56	6	16.03	16.00	.20
	3	20.58	20.56	8	16.07	16.00	.22
	—	—	—	1	16.10	16.00	.22
Chilean Nitrate Sales Corp.	—	—	—	7	16.09	16.00	.26
	—	—	—	1a	15.92	15.22	.22
	—	—	—	3a	15.81	15.25	.54
	—	—	—	4a	15.60	15.50	.50
	—	—	—	3a	15.93	15.50	.60
	—	—	—	7b	16.08	16.00	.44
Consolidated Rendering Co.	5	20.77	20.50	1	16.13	16.00	.24
	7	20.56	20.50	—	—	—	—
Eastern States Farmers' Exchange	2	20.55	20.50	—	—	—	—
Ford Motor Co.	2	20.84	20.80	—	—	—	—
Goulard & Olena, Inc.	1	20.83	20.75	—	—	—	—
International Agricultural Corp.	4	20.59	20.56	—	—	—	—
	5	20.59	20.56	—	—	—	—
Merrimac Chemical Co.	—	—	—	1	16.27	16.25	.24
Old Deerfield Fertilizer Co.	1	21.02	20.50	1	15.68	15.50	.40

a Standard brand.

b Champion brand.

## Nitrate of Potash, Nitrate of Soda-Potash

MANUFACTURER	Number of Samples	NITROGEN		POTASSIUM OXIDE		Chlorine
		Found	Guar- anteed	Found	Guar- anteed	
Apothecaries Hall Co.	2	13.09	13.00	44.10	44.00	.40
Chilean Nitrate Sales Corp.	4a	14.80	14.00	44.48	44.00	.46
Eastern States Farmers' Exchange	2	13.04	13.00	44.15	44.00	.40
International Agricultural Corp.	1a	14.71	14.00	16.16	14.00	.60
Old Deerfield Fertilizer Co.	2	13.21	13.00	44.44	44.00	.28

a Nitrate of Soda-Potash.

## Cottonseed Meal

MANUFACTURER	BRAND	NITROGEN	
		Found	Guaranteed
Ashcraft-Wilkinson Co. . . . .	Cow-Eta Brand . . . . .	6.59	6.58
	Cow-Eta Brand . . . . .	6.54	6.56
	Cow-Eta Brand . . . . .	6.76	6.56
	Cow-Eta Brand . . . . .	6.74	6.56
	Cow-Eta Brand . . . . .	6.78	6.56
	Cow-Eta Brand . . . . .	6.66	6.58
	Cow-Eta Brand . . . . .	6.72	6.56
	Cow-Eta Brand . . . . .	6.60	6.58
	Cow-Eta Brand . . . . .	6.84	6.56
	Cow-Eta Brand . . . . .	6.55	6.56
Humphreys-Godwin Co. . . . .	Cow-Eta Brand . . . . .	6.66	6.58
	Dixie Brand . . . . .	6.77	6.56
	Dixie Brand . . . . .	6.59	6.56
	Dixie Brand . . . . .	6.63	6.56
	Dixie Brand . . . . .	6.66	6.56
	Dixie Brand . . . . .	6.63	6.56
	Dixie Brand . . . . .	6.67	6.56
	Dixie Brand . . . . .	6.64	6.56
	Dixie Brand . . . . .	6.66	6.56
	Dixie Brand . . . . .	6.43	6.56
	Dixie Brand . . . . .	6.42	6.56
	Dixie Brand . . . . .	6.79	6.58
	Dixie Brand . . . . .	6.69	6.56
	Dixie Brand . . . . .	6.76	6.58
	Dixie Brand . . . . .	6.84	6.58
	Dixie Brand . . . . .	6.85	6.58
	Dixie Brand . . . . .	6.68	6.58
	Dixie Brand . . . . .	6.70	6.58
	Dixie Brand . . . . .	6.79	6.58
	Dixie Brand . . . . .	7.01	6.58
	Dixie Brand . . . . .	6.57	6.58
	Dixie Brand . . . . .	6.56	6.56
	Dixie Brand . . . . .	6.66	6.58
	Dixie Brand . . . . .	6.61	6.58
	Dixie Brand . . . . .	6.66	6.56
	Dixie Brand . . . . .	6.63	6.58
L. B. Lovitt & Co. . . . .	Lovitt Brand . . . . .	6.65	6.56
	Lovitt Brand . . . . .	6.66	6.56
	Lovitt Brand . . . . .	6.70	6.56
	Lovitt Brand . . . . .	6.70	6.56
	Lovitt Brand . . . . .	6.67	6.56
Southern Cotton Oil Co. . . . .	SCO-CO Brand . . . . .	6.81	6.58
Swift & Company, Oil Mills . . . . .	Cottonbloom Brand . . . . .	6.63	6.56

## Brands Showing a Commercial Shortage of More than \$1 per Ton

Ashcraft-Wilkinson Co. . . . .	Cow-Eta Brand . . . . .	6.30 <sup>a</sup>	6.56
Humphreys-Godwin Co. . . . .	Dixie Brand . . . . .	6.23 <sup>b</sup>	6.56
	Dixie Brand . . . . .	6.21 <sup>c</sup>	6.56
	Dixie Brand . . . . .	6.30 <sup>d</sup>	6.56

<sup>a</sup> Commercial shortage per ton, \$1.65.<sup>b</sup> Commercial shortage per ton, \$2.12.<sup>c</sup> Commercial shortage per ton, \$2.25.<sup>d</sup> Commercial shortage per ton, \$1.55.

## Cottonseed Meal — Castor Pomace Mixtures

MANUFACTURER AND BRAND	NITROGEN	
	Found	Guaranteed
<b>Apothecaries Hall Co.</b>		
Cottonseed Meal, Castor Pomace Mixture . . . . .	6.77	5.75
Cottonseed Meal, Castor Pomace Mixture . . . . .	6.75	5.75
<b>Eastern States Farmers' Exchange</b>		
Eastern States Cottonseed Meal — Castor Pomace Mix . . . . .	6.62	6.30
Eastern States Cottonseed Meal — Castor Pomace Mix . . . . .	6.80	6.30
Eastern States Cottonseed Meal — Castor Pomace Mix . . . . .	6.61	6.80
<b>Old Deerfield Fertilizer Co., Inc.</b>		
Japan Cottonseed Meal Mixture . . . . .	6.78	6.40
Japan Cottonseed Meal Mixture . . . . .	6.61	6.40
<b>Olds &amp; Whipple, Inc.</b>		
95% Cottonseed Meal — 5% Castor Pomace Mixture . . . . .	6.63	6.40
95% Cottonseed Meal — 5% Castor Pomace Mixture . . . . .	6.64	6.40
95% Cottonseed Meal — 5% Castor Pomace Mixture . . . . .	6.54	6.40

## Castor Pomace and Linseed Meal

MANUFACTURER	BRAND	NITROGEN	
		Found	Guaranteed
<b>American Agricultural Chemical Co.</b>	Castor Pomace . . . . .	5.64	4.50
<b>Armour Fertilizer Works . . . . .</b>	Castor Pomace . . . . .	5.62	4.52
<b>Berkshire Chemical Co. . . . .</b>	Castor Pomace . . . . .	5.07	4.50
	Castor Pomace . . . . .	6.16	4.50
	Castor Pomace . . . . .	5.22	4.50
	Castor Pomace . . . . .	5.07	4.50
	Castor Pomace . . . . .	4.97	4.50
<b>Bisbee Linseed Co. . . . .</b>	K & M Old Process Linseed Meal . . . . .	5.14	5.12
<b>Old Deerfield Fertilizer Co., Inc. . . . .</b>	Castor Pomace . . . . .	5.90	4.52
<b>Spencer Kellogg &amp; Sons, Inc. . . . .</b>	Kellogg's Linseed Meal . . . . .	5.25	5.12
<b>Standard Wholesale Phosphate &amp; Acid Works, Inc. . . . .</b>	Castor Pomace . . . . .	5.95	4.52

## Calcium Nitrate, Cal-Nitro, Calcium Cyanamid and Urea

MANUFACTURER	BRAND	Number of Samples	NITROGEN	
			Found	Guaranteed
<b>American Cyanamid Co. . . . .</b>	"Aero" Cyanamid, Granular . . . . .	3	21.71	21.00
	"Aero" Cyanamid, Granular . . . . .	1	21.47	21.00
	"Aero" Cyanamid, Granular . . . . .	1	21.12	21.00
<b>Eastern States Farmers' Exchange</b>	Agricultural Urea . . . . .	1	42.06	42.00
	Urea . . . . .	2	46.31	46.00
	Cal-Nitro . . . . .	6	20.80	20.50
<b>Foodndrink Fertilizer Co. . . . .</b>	Foodndrink . . . . .	1a	15.37	13.00
<b>Olds &amp; Whipple, Inc. . . . .</b>	Cal-Nitro . . . . .	1	21.05	20.50
<b>Synthetic Nitrogen Products Corp. . . . .</b>	Calcium Nitrate . . . . .	1b	15.96	15.00
	Cal-Nitro . . . . .	1	20.55	20.50
	Urea . . . . .	2	46.28	46.00

a Chlorine, .24%; nitrogen largely as nitrate.

b Chlorine, .16%.

## Dried Blood, Milorganite and Horn and Hoof Meal

MANUFACTURER AND BRAND	Number of Samples	NITROGEN		PHOSPHORIC ACID	
		Found	Guar- anteed	Found	Guar- anteed
Apothecaries Hall Co. Horn and Hoof Meal	1	14.94	14.80	.66	—
Consolidated Rendering Co. Dried Blood	1	13.63	13.00	.26	—
John Reardon & Sons Co. Rearco Dried Blood	2	9.25	10.00	5.62	—
Sewerage Commission of Milwaukee Milorganite	6	6.04	6.00	2.71	2.75

## Brand Showing Commercial Shortage of More than \$1 per Ton

New England Rendering Co. Brighton Blood Tankage	2 <sup>a</sup>	10.79 <sup>b</sup>	11.51	2.51	—
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<sup>a</sup> One sample taken at Butchers Rendering Co., Fall River, and one sample taken at T. J. Grey Co., Boston.

<sup>b</sup> Commercial shortage, \$1.99 per ton.

## Phosphoric Acid Compounds

## Superphosphate, Precipitated Bone and Basic Slag Phosphate

MANUFACTURER AND BRAND	Number of Samples	Total Phosphoric Acid	AVAILABLE PHOSPHORIC ACID	
			Found	Guaranteed
<b>Acme Guano Co.</b>				
Sergeant's 16% Superphosphate . . . . .	1	16.01	15.76	16.00
<b>American Agricultural Chemical Co.</b>				
AA 16% Superphosphate . . . . .	8	17.85	16.82	16.00
AA 16% Superphosphate . . . . .	5	17.68	16.55	16.00
AA 20% Superphosphate . . . . .	3	21.49	20.68	20.00
Co-Op 16% Superphosphate . . . . .	5	17.65	16.68	16.00
<b>Apothecaries Hall Co.</b>				
Superphosphate 16% . . . . .	2	17.42	16.49	16.00
Superphosphate 20% . . . . .	1	21.65	20.53	20.00
<b>Armour Fertilizer Works</b>				
Armours Big Crop Superphosphate 16% . . . . .	7	16.64	15.74	16.00
Armours Big Crop Superphosphate 20% . . . . .	2	19.94	19.34	20.00
<b>Berkshire Chemical Co.</b>				
Berkshire Superphosphate 16% . . . . .	2	17.42	17.16	16.00
Berkshire Precipitated Bone . . . . .	1	38.59	38.27	38.00
<b>Consolidated Rendering Co.</b>				
Superphosphate 16% . . . . .	8	17.03	16.89	16.00
Superphosphate 16% . . . . .	8	16.51	16.38	16.00
<b>Davison Chemical Corp.</b>				
Davco Granulated 20% Superphosphate . . . . .	6	21.58	20.48	20.00
<b>Eastern States Farmers' Exchange</b>				
Eastern States 20% Superphosphate (Granular) . . . . .	3	21.22	20.80	20.00
Eastern States 20% Superphosphate (Pulverized) . . . . .	7	21.54	20.53	20.00
Eastern States 40% Double Superphosphate (Granular) . . . . .	4	42.65	40.86	40.00
Eastern States 40% Double Superphosphate (Pulverized) . . . . .	2	41.88	40.76	40.00
Eastern States Precipitated Bone . . . . .	1	41.37	39.30	38.00
<b>International Agricultural Corp.</b>				
International Superphosphate . . . . .	10	16.58	16.26	16.00
International Superphosphate . . . . .	5	16.65	16.30	16.00
International 20% Superphosphate . . . . .	4	20.67	20.41	20.00
International Basic Slag . . . . .	2	17.41	15.90	14.00
<b>Old Deerfield Fertilizer Co., Inc.</b>				
Old Deerfield 16% Superphosphate . . . . .	1	17.71	17.13	16.00
<b>Rogers &amp; Hubbard Co.</b>				
Superphosphate 16% . . . . .	5	16.91	16.71	16.00
Superphosphate 20% . . . . .	1	21.40	21.09	20.00
<b>Standard Wholesale Phosphate &amp; Acid Works, Inc.</b>				
Standard Superphosphate 16% . . . . .	1	20.28	19.74	16.00
Standard Superphosphate 20% . . . . .	1	20.64	20.51	20.00
<b>C. P. Washburn Co.</b>				
Superphosphate . . . . .	1	16.97	16.27	16.00
20% Superphosphate . . . . .	1	21.28	20.97	20.00

## Potash Compounds

## Sulfate of Potash-Magnesia

MANUFACTURER	Number of Samples	POTASH		MAGNESIUM OXIDE	Chlorine
		Found	Guaranteed	Water Soluble Found	
Eastern States Farmers' Exchange . . . . .	{ 1	28.96	26.00	13.48	1.00
N. V. Potash Export My., Inc. . . . .	{ 1	24.76	26.00	9.06*	2.04
	1	31.24	25.00	12.63	1.32

\* Also contained 5.87% calcium oxide.



## Muriate and High Grade Sulfate of Potash

MANUFACTURER	MURIATE OF POTASH			HIGH GRADE SULFATE OF POTASH			
	Number of Samples	POTASH		Number of Samples	POTASH		Chlorine
		Found	Guaranteed		Found	Guaranteed	
American Agricultural Chemical Co. . . . .	{ 4	50.25	50.00	1	50.63	48.00	2.09
	{ 4	60.12	60.00	2	49.60	48.00	1.96
Apothecaries Hall Co. . . . .	1	62.52	60.00	—	—	—	—
Armour Fertilizer Works . . . .	{ 3	50.19	50.00	—	—	—	—
	{ 1	59.72	60.00	—	—	—	—
Consolidated Rendering Co. . . .	{ 2	53.76	50.00	2	49.81	48.00	2.04
	{ 6	50.08	50.00	2	50.18	48.00	2.12
	{ 5	60.32	60.00	—	—	—	—
	{ 2	60.28	60.00	—	—	—	—
	{ 1	61.27	60.00	—	—	—	—
Eastern States Farmers' Exchange . . . . .	{ 7	61.32	60.00	1	49.77	48.00	2.08
	{ 1	61.48	60.00	1	49.65	48.00	1.54
N. V. Potash Export My., Inc. . . .	{ 6	51.41	50.00	1	49.42	48.00	2.02
	{ 6	62.69	60.00	1	48.96	48.00	2.30
	{ 3	61.93	60.00	2	49.87	48.00	2.28
Old Deerfield Fertilizer Co., Inc. .	1	61.49	60.00	—	—	—	—

## Dry Ground Fish

MANUFACTURER	Number of Samples	NITROGEN		PHOSPHORIC ACID		Chlorine
		Found	Guaranteed	Found	Guaranteed	
American Agricultural Chemical Co. .	1	8.75	9.00	5.04	4.00	.41
Apothecaries Hall Co. . . . .	1	9.51	9.46	7.25	5.00	.98
Berkshire Chemical Co. . . . .	{ 3	9.48	9.45	6.84	5.00	.25
	{ 1	9.53	9.46	6.45	5.00	.15
Consolidated Rendering Co. . . . .	1	10.19	9.80	8.23	9.00	.73
Eastern States Farmers' Exchange . .	1	9.26	9.00	6.46	5.00	.72
International Agricultural Corp. . . .	{ 1	8.54	9.00	9.51	4.00	.68
	{ 1	8.51	9.00	9.58	4.00	.68
	{ 1	8.57	9.00	9.84	4.00	.68
Old Deerfield Fertilizer Co., Inc. . .	{ 2	10.15	9.05	7.20	5.00	.49
	{ 3	9.55	9.46	7.28	5.00	.35
Rogers & Hubbard Co. . . . .	2	9.53	9.46	7.21	5.00	.35

## Brands Showing Commercial Shortage of More than \$1 per Ton

American Agricultural Chemical Co. .	1a	8.64	9.00	5.47	4.00	.41
Consolidated Rendering Co. . . . .	1b	8.08	9.80	7.94	9.00	.72

a Commercial shortage per ton, \$1.02.

b Commercial shortage per ton, \$12.13.

## Ammono-Phos

MANUFACTURER	Number of Samples	NITROGEN		PHOSPHORIC ACID		
		Found	Guaranteed	Total	AVAILABLE	
					Found	Guaranteed
American Cyanamid Co.	5	11.20	11.00	49.87	48.85	48.00
	1	16.15	16.00	22.94	21.89	20.00

## Animal Tankage

MANUFACTURER	Number of Samples	NITROGEN		TOTAL PHOSPHORIC ACID		DEGREE OF FINENESS	
		Found	Guaranteed	Found	Guaranteed	Finer than 1/50 Inch	Coarser than 1/50 Inch
American Agricultural Chemical Co.	3	7.91	7.40	10.12	9.15	52.15	47.85
	5	10.03	10.00	6.52	6.87	49.53	50.47
	1	10.19	10.00	6.54	6.87	51.19	48.81
Armour Fertilizer Works	1	7.22	7.40	4.48	4.00	61.13	38.87
	1	7.61	7.41	12.97	9.15	22.95	77.05
	1	8.74	8.50	9.77	9.80	47.36	52.64
Consolidated Rendering Co.	1	9.78	10.00	8.09	6.87	32.16	67.84
	1	9.68	10.00	8.11	6.87	37.22	62.78
	1	9.90	10.00	7.70	6.87	31.64	68.36
	1	9.79	10.00	7.20	6.87	29.39	70.61
	1	9.72	10.00	7.91	6.87	30.47	69.53
	1	9.53	10.00	8.81	6.87	43.81	56.19
	1	9.83	10.00	7.74	6.87	32.15	67.85
	1	10.19	10.00	7.70	6.87	31.41	68.59
	1	7.73	7.40	12.35	9.15	20.14	79.86
A. W. Hunt	1	5.07	5.00	16.54	14.00	56.89	43.11
N. Roy & Son	1	8.03	7.00	10.20	8.00	49.77	50.23
Woodard Brothers	1	4.72	4.50	22.28	18.00	28.35	71.65

## Brands Showing Commercial Shortage of More than \$1 per Ton

American Agricultural Chemical Co.	1a	9.77	10.00	7.35	6.87	40.34	59.66
Apothecaries Hall Co.	1b	9.95	10.00	1.77	6.00	47.10	52.90
Consolidated Rendering Co.	1c	8.95	10.00	8.53	6.87	46.77	53.23
	1d	9.25	10.00	8.94	6.87	43.42	56.58
	1e	9.08	10.00	9.29	6.87	61.38	38.62
	1f	9.09	10.00	9.42	6.87	60.75	39.25
	1g	9.35	10.00	9.38	6.87	50.36	49.64
	1h	9.68	10.00	7.32	6.87	27.14	72.86
	1i	9.14	10.00	8.92	6.87	47.64	52.36

The commercial shortages were as follows: a \$2.85; b \$3.75; c \$4.24; d \$2.25; e \$3.13; f \$2.94; g \$1.45; h \$1.22; i \$2.91.

Note: Deficiencies in the Consolidated Rendering Co.'s brands were confined to the 10-6.87 grade of tankage supplied the State institutions. The product was not manufactured by the Consolidated Rendering Co., but was bought on the market under a guarantee of nitrogen and phosphoric acid as indicated in the table. Assuming that the product was well up to the guarantee, deliveries were made without retesting. Proper rebates were made in all cases.

## Ground Bone

MANUFACTURER	Number of Samples	NITROGEN		TOTAL PHOS- PHORIC ACID		DEGREE OF FINENESS	
		Found	Guar- anteed	Found	Guar- anteed	Finer than 1/50 Inch	Coarser than 1/50 Inch
American Agricultural Chemi- cal Co.	8	2.47	2.47	24.53	23.00	78.45	21.55
	1	3.18	2.47	22.79	23.00	68.87	31.13
Apothecaries Hall Co.	5	2.47	2.47	25.25	22.00	71.80	28.20
	2	3.80	3.70	21.02	21.00	32.16	67.84
Armour Fertilizer Works	6	2.80	2.47	23.37	23.00	66.28	33.72
Berkshire Chemical Co.	3	1.88	2.05	29.47	25.00	75.66	24.34
Joseph Breck & Sons Corp.	3	2.48	2.47	25.41	22.88	67.82	32.18
Consolidated Chemical Indus- tries, Inc.	1	1.32	.82	32.92	32.00	54.86	45.14
Consolidated Rendering Co.	10	2.43	2.47	25.14	23.00	71.79	28.21
Eastern States Farmers' Ex- change	3	3.01	2.50	21.71	23.00	59.19	40.81
Goulard & Olena, Inc.	2	2.64	2.40	26.66	22.75	86.15	13.85
Dr. Heinz Co.	1	1.39	1.00	31.11	29.00	81.33	18.67
A. H. Hoffman, Inc.	2	4.39	3.70	20.27	20.00	63.18	36.82
International Agricultural Corp.	6	2.41	2.47	24.50	22.00	70.91	29.09
Master Meat Products Co.	1	4.30	4.00	23.33	25.00	53.41	46.59
Old Deerfield Fertilizer Co., Inc.	3	3.28	2.47	27.91	22.00	79.18	20.82
John Reardon & Sons Co.	6	2.48	2.47	25.32	22.88	69.21	30.79
Rogers & Hubbard Co.	6	2.68	2.47	24.39	23.00	72.72	27.28
	7	3.89	3.70	25.25	24.70	92.33	7.67
	5	3.89	3.70	23.84	20.00	59.12	40.88
F. Rynveld & Sons, Inc.	3	2.58	2.47	29.23	22.00	79.70	20.30
Standard Wholesale Phosphate & Acid Works, Inc.	2	2.35	2.47	26.84	22.00	43.62	56.38
Swift & Company Fertilizer Works	8	2.93	2.47	24.43	23.00	74.63	25.37
C. P. Washburn Co.	1	2.51	2.50	25.11	23.00	51.56	48.44

## Brands Showing Commercial Shortage of More than \$1 per Ton

Consolidated Rendering Co.	1a	3.75	4.00	20.30	20.00	40.71	59.29
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a Commercial shortage, \$1.06 per ton.

## Pulverized Animal Manures

MANUFACTURER	BRAND	Number of Samples	TOTAL NITROGEN		TOTAL PHOSPHORIC ACID		TOTAL POTASH		Organic Matter	Moisture
			Found	Guaranteed	Found	Guaranteed	Found	Guaranteed		
American Agricultural Chemical Co.	Pulverized Sheep and Goat Manure	8	1.29	1.25	1.10	1.00	2.99	2.00	28.71	24.46
Apothecaries Hall Co.	{ Liberty Domestic Sheep Manure Pulverized Sheep and Goat Manure	2 2	1.57 1.52	1.00 1.25	.76 .95	.75 .50	3.52 4.48	1.50 2.00	38.14 37.99	18.07 15.97
Armour Fertilizer Works	Armour Sheep and Goat Manure	7	1.53	1.25	1.87	1.00	3.89	2.00	34.95	17.76
Atkins & Durbrow, Inc.	{ Driconure Henure	2 3	1.98 2.79	1.00 3.00	1.76 3.16	1.00 1.00	1.66 1.28	1.00 1.00	76.14 54.59	8.22 11.59
Berkshire Chemical Co.	Berkshire Sheep and Goat Manure	1	1.57	1.25	1.27	1.00	3.90	2.00	40.29	15.00
Joseph Breck & Sons Corp.	Ram's Head Brand Pulverized Sheep Manure	4	1.55	1.25	.68	1.00	3.67	2.00	43.63	14.11
Buell Fertilizer Co.	{ Buell Peat-Poultry Manure Buell Peat-Poultry Manure	1 1	2.85 2.93	3.00 3.00	2.64 3.04	3.00 3.00	1.64 1.39	1.50 1.50	59.98 62.25	21.78 17.80
Consolidated Rendering Co.	{ Corenco Sheep Manure Corenco Sheep Manure	7 4	1.36 1.30	1.25 1.25	1.37 1.61	1.00 1.00	3.36 3.49	2.00 2.00	31.21 34.05	18.59 18.00
Davey Tree Expert Co.	Davey Shredded Cattle Manure	1	2.01	1.00	2.62	1.00	2.63	2.00	77.73	4.60
Goulard & Olena, Inc.	G & O Sheep Manure	2	2.14	1.50	2.68	1.50	2.93	2.00	42.80	15.86
A. H. Hoffman, Inc.	{ Hoffman's Cow Manure Hoffman's Sheep Manure	2 2	2.01 2.59	2.00 1.85	1.50 1.35	2.00 1.00	2.02 2.47	2.00 2.00	78.81 56.42	6.90 4.86
International Agricultural Corp.	International Caribee Sheep Manure	6	1.37	1.02	1.24	.50	3.43	2.00	30.56	20.07
Natural Guano Co.	Sheep's Head Brand Pulverized Sheep Manure (1936 stock)	1	1.68	2.00	.81	1.00	2.93	2.00	60.65	8.31
Pacific Manure & Fertilizer Co.	Groz-It Brand Pulverized Sheep Manure	1	1.62	1.25	.77	1.00	3.78	2.00	42.11	16.35

## Pulverized Animal Manures — Concluded

MANUFACTURER	BRAND	Number of Samples	TOTAL NITROGEN		TOTAL PHOSPHORIC ACID		TOTAL POTASH		Organic Matter	Mois- ture
			Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed		
Premier Poultry Manure Co.	{ Premier Brand Shredded Cattle Manure Premier Brand Pulverized Poultry Ma- nure Premier Brand Pulverized Sheep Manure }	4	2.24	1.65	1.25	.85	3.18	2.00	59.42	9.37
		7	5.11	4.93	2.20	2.75	1.13	1.30	66.08	11.56
		2	2.22	1.65	1.12	1.00	2.07	2.00	44.91	9.08
Pulverized Manure Co.	{ Wizard Brand Cow Manure Wizard Brand Pulverized Sheep Manure }	3	1.89	2.00	1.09	1.00	1.53	1.00	62.56	8.26
		5	2.04	2.00	1.84	1.00	3.82	2.00	66.16	9.33
John Reardon & Sons Co.	{ Rearco Sheep Manure Rearco Sheep Manure }	4	1.79	1.25	1.13	1.00	3.02	2.00	50.60	7.27
		1	1.87	1.25	1.17	1.00	2.83	2.00	47.09	8.96
Rogers & Hubbard Co.	Sheep and Goat Manure	5	1.49	1.25	1.18	.75	3.35	2.00	31.23	13.06
F. Rynveld & Sons, Inc.	Moo-Cow Natural Manure	1	1.43	1.48	.88	.81	2.16	1.80	46.50	7.32
Standard Wholesale Phosphate & Acid Works, Inc.	Pulverized Sheep Manure	1	2.18	1.25	1.98	1.00	.49	2.00	36.67	7.77
		2	2.32	2.00	1.57	1.00	2.50	2.00	59.85	11.98
Stockdale Fertilizer Co.	Ovene (Sheep Manure)									
Swift & Company Fertilizer Works	Swift's Sheep Manure	3	1.94	1.85	1.06	1.00	2.84	1.75	56.44	7.70
Walker Gordon Laboratory Co., Inc.	Bovung	6	2.09	2.00	1.76	2.00	2.38	2.00	76.28	7.35
W. W. Windle Co.	Natural Sheep Manure Dusted from Wool	1	1.77	1.75	.56	.38	5.77	5.25	40.75	10.07
Thomas Wood & Sons, Inc.	{ Woodgro Pure Cow Manure Woodgro Pure Cow Manure }	1	2.03	2.00	3.17	2.00	1.85	3.00	58.73	7.97
		2	2.21	2.00	3.54	2.00	2.18	3.00	59.86	10.03

## Brands Showing Commercial Shortage of More than \$1 per Ton

Buell Fertilizer Co.	{ Buell Peat-Poultry Manure Buell Peat-Poultry Manure }	1a 1b	2.17 2.29	3.00 3.00	2.77 2.74	3.00 3.00	1.52 1.29	1.50 1.50	47.48 43.16	19.33 18.21

a Commercial shortage, \$3.89 per ton.

b Commercial shortage, \$3.53 per ton.

## Miscellaneous Fertilizer Materials

## Ground Tobacco Stems

MANUFACTURER	Moisture	NITROGEN		PHOSPHORIC ACID		POTASSIUM OXIDE		Organic Matter
		Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
Tobacco By-Products & Chemical Corp.	4.42	1.51	1.16	.66	-	4.34	4.00	58.04

## Organo #1 (1-.5-.5)

MANUFACTURER	Moisture	FORMS OF NITROGEN FOUND				Available Phosphoric Acid	Water Soluble Potash	Organic Matter
		Total	Ammoniacal	Nitrate	Organic			
Organic Fertilizer Corp.	14.55	2.04	.12	.10	1.82	1.31	.68*	48.73

\* Total potash .73%.

## Commercial Peat Products

MANUFACTURER AND BRAND	Number of Samples	Water	Organic Matter	Mineral Matter	NITROGEN	
					Found	Guaranteed
Brague, Inc.						
Hinsdale Leafmold . . . .	1	65.75	31.75	2.50	.67	.50
Florida Humus Co.						
Florida Humus . . . . .	2	37.47	57.22	5.31	2.27	2.18

## Cotton Hull Ashes and Wood Ashes

MANUFACTURER AND BRAND	Moisture	PHOSPHORIC ACID		POTASSIUM OXIDE		Calcium Oxide	Magnesium Oxide	Insoluble Matter
		Found	Guaranteed	Found	Guaranteed			
<b>Apothecaries Hall Co.</b>								
Cotton Hull Ashes . . . . .	5.35	3.21	—	29.85	25.00	11.86	5.23	19.67
<b>Berkshire Chemical Co.</b>								
Berkshire Cotton Hull Ashes . . . . .	5.13	2.97	—	25.91	25.00	14.67	5.49	17.16
Berkshire Cotton Hull Ashes . . . . .	4.62	3.00	—	23.75	25.00	14.02	4.92	20.79
<b>Eastern States Farmers' Exchange</b>								
Eastern States Cottonhull Ash . . . . .	4.48	3.37	—	31.28	25.00	12.50	4.85	17.66
<b>John Joynt</b>								
Joynt's Canada Hardwood Ashes . . . . .	16.99	1.50	2.00	6.05	5.00	29.85	3.43	6.87
<b>Old Deerfield Fertilizer Co., Inc.</b>								
Old Deerfield Cotton Hull Ashes . . . . .	6.33	3.25	—	25.40	25.00	11.58	5.30	18.26
Old Deerfield Cotton Hull Ashes . . . . .	5.68	3.39	—	22.89	25.00	13.47	5.81	20.79
<b>George Stevens</b>								
Canadian Unleached Hardwood Ashes . . . . .	16.91	1.31	1.00	3.73	3.00	34.08	2.47	9.46
Canadian Unleached Hardwood Ashes . . . . .	10.65	1.64	1.00	2.84	3.00	22.41	1.93	28.60
Canadian Unleached Hardwood Ashes . . . . .	3.76	1.89	1.00	4.54	3.00	27.64	2.17	23.99

## Brands Showing Commercial Shortage of More than \$1 per Ton

<b>John Joynt</b>								
Joynt's Canada Hardwood Ashes . . . . .	26.14	1.71	2.00	3.73 <sup>a</sup>	5.00	28.96	3.65	8.06
Joynt's Canada Hardwood Ashes . . . . .	6.11	1.54	2.00	2.99 <sup>b</sup>	5.00	23.30	2.28	32.27

<sup>a</sup> Commercial shortage, \$1.59 per ton.<sup>b</sup> Commercial shortage, \$3.58 per ton.

## Colloidal Phosphate with Mineral Colloids

This product was first registered in Massachusetts in 1929 by the Natural Products Corp., Ocala, Florida, under the name of "Florida Phosphate with Colloidal Clay." Later in the same year the name was changed to "Colloidal Phosphate."

In 1930 it was registered as "Colloidal Phosphate" by the Colloidal Phosphate Sales Corp. of New England, located at 126 Newbury Street, Boston, Massachusetts. During 1930 two hundred eighty-two tons were sold in the state.

In 1931 it was registered by the Mardal Corp., 370 Lexington Avenue, New York City. No sales were recorded in Massachusetts during that year.

The following description of the product appears on page 51, Control Bulletin 51, published in 1929 by the Massachusetts Agricultural Experiment Station. This description is applicable to the present-day product, although it is claimed by the present promoters, Colloidal Products of America, Inc., Soil Builders, Inc. Branch, Orlando, Florida, that an attempt is now made to standardize the material so that it will run uniform in composition.

"This product is a low-analysis natural Florida phosphate known to the industry as 'pond phosphate,' a by-product in mining Florida rock phosphate. In the recovery of this Florida rock phosphate, water is used. The soft, finely divided phosphate, with more or less clay and silt, is washed into ponds or basins, the finer material separating more abundantly at points farthest from the washer. When the water evaporates, the very finely divided deposit remains, and this is the source of the product under discussion."

The material is lower in phosphorus and higher in iron and aluminum than the raw rock considered suitable for the manufacture of superphosphate. Its use as a fertilizer is therefore restricted at present to direct application to the soil. From a fertilizer standpoint it supplies only phosphorus — and that in the tricalcium, iron, and aluminum phosphate forms which are not readily available according to official methods of analysis.

In 1930 a vegetation pot test was conducted at this institution on some comparatively new phosphates, including Colloidal Phosphate. (Pages 54-63, Control Bulletin 54, Massachusetts Agricultural Experiment Station.) Briefly stated, there was but little difference between Colloidal Phosphate and finely ground rock phosphate, either in the dry matter yield or in the phosphoric acid recovered. In Series I where the minimum phosphoric acid ration was used, neither of these phosphates showed any average gain in dry matter yield over the no-phosphate pots. Based on phosphoric acid recovery, both of these raw mineral phosphates showed phosphoric acid availability amounting to about one-fourth that of superphosphate.

A comparison of the product sold in Massachusetts in 1930 with the product registered in 1937 is shown by the following analysis.

	1930 Percent	1937 Percent
Moisture	4.47	4.64
Total phosphoric acid	21.61	2.14
Available phosphoric acid in neutral citrate of ammonia solution	.21	2.88
Insoluble phosphoric acid in neutral citrate of ammonia solution	21.40	20.26
Water soluble potash	None	None
Total nitrogen	.03	.10
Total calcium oxide	25.34	24.23
Magnesium oxide	1.34	.62
Carbon dioxide	4.95	1.63
Iron oxide ( $\text{Fe}_2\text{O}_3$ )	15.24	3.63
Aluminum oxide ( $\text{Al}_2\text{O}_3$ )		14.75
Soluble sulfates	Trace	Trace
Chlorine	Trace	Trace
Insoluble matter	22.18	17.41



These analyses show the products to be quite similar in composition. Based upon the 1937 analysis we should judge that the actual composition of the product was about as follows:

	Percent
Magnesium carbonate ( $\text{MgCO}_3$ ) . . . . .	1.30
Calcium carbonate ( $\text{CaCO}_3$ ) . . . . .	2.18
Tri-calcium phosphate ( $\text{Ca}_3(\text{PO}_4)_2$ ) . . . . .	42.43
Aluminum phosphate ( $\text{AlPO}_4$ ) . . . . .	3.20
Iron phosphate ( $\text{FePO}_4$ ) . . . . .	3.95
Aluminum oxide ( $\text{Al}_2\text{O}_3$ ) . . . . .	13.41
Ferric oxide ( $\text{Fe}_2\text{O}_3$ ) . . . . .	1.54
Moisture . . . . .	4.64
Organic and volatile matter . . . . .	9.94
Insoluble matter, largely clay . . . . .	17.41
<b>Total . . . . .</b>	<b>100.00</b>

### Wright's Plant Aid

Manufactured and registered by Wright Co., Old Bridge, N. J.

	Percent
Moisture . . . . .	14.26
Organic matter . . . . .	26.14
Total phosphoric acid . . . . .	.57
Total potassium oxide . . . . .	.23
Water soluble potassium oxide . . . . .	.19
Total nitrogen . . . . .	1.44
Ammoniacal nitrogen . . . . .	.08
Nitrate nitrogen . . . . .	.07
Water soluble organic nitrogen . . . . .	.22
Water insoluble organic nitrogen . . . . .	1.07
Activity of insoluble nitrogen by alkaline permanganate method . . . . .	33.40*

\* Indicates low grade quality: the passing mark by this method is 50. The product is used largely in planting shrubs and flowering plants.

### Menderth

Manufactured by Menderth, Inc.

PLANT FOOD ELEMENTS	GUARANTEED	FOUND SOLUBLE IN STRONG HYDROCHLORIC ACID
Potassium oxide . . . . .	3.00	1.52
Phosphoric acid . . . . .	.13	.15
Calcium oxide . . . . .	3.00	2.23
Magnesium oxide . . . . .	2.00	2.46

NOTE: The product contained .08% water soluble potassium oxide and 73.82% insoluble matter. The commercial value of the plant food contained in one ton of the product, based upon its content of potash, phosphoric acid, calcium, and magnesium, soluble in strong hydrochloric acid, would be about \$1.75. Any potash, phosphoric acid, calcium or magnesium that may be present in the product in a form insoluble in strong hydrochloric acid would have little or no value.

# DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZER FOR SALE IN MASSACHUSETTS IN 1937

Aeae Guano Co., 416 Munsey Bldg., Baltimore, Md.  
 Agricultural Laboratories, Inc., 3415 Milton Ave., Columbus, Ohio.  
 American Agricultural Chemical Co., 285 River St., North Weymouth, Mass.  
 American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.  
 American Soda Products Co., Moorestown, N. J.  
 Apothecaries Hall Co., Waterbury, Conn.  
 Armour Fertilizer Works, 120 Broadway, New York, N. Y.  
 Ashcraft-Wilkinson Co., Atlanta, Ga.  
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.  
 Atlantic States Fertilizer Co., 1418 Broadway, Haverhill, Mass.  
 Barrett Co., 40 Rector St., New York, N. Y.  
 Barrie Laboratories, Inc., 84 State St., Boston, Mass.  
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.  
 Belmont Gardens, 170 Brighton St., Belmont, Mass.  
 Berkshire Chemical Co., 92 Howard Ave., Bridgeport, Conn.  
 Bisbee Linseed Co., Amsterdam, N. Y.  
 Woodworth Bradley, Inc., 156 South Main St., Providence, R. I.  
 Bague, Inc., Hinsdale, Mass.  
 Joseph Breck & Sons Corp., 85 State St., Boston, Mass.  
 Buell Fertilizer Co., Exeter, N. H.  
 Cairo Meal and Cake Co., Cairo, Ill.  
 Chilean Nitrate Sales Corp., 120 Broadway, New York, N. Y.  
 Clay & Son, Ltd., Stratford, London, England.  
 Collins Seed Service Co., 131 Beverly St., Boston, Mass.  
 Consolidated Chemical Industries, Inc., 630 Fifth Ave., New York, N. Y.  
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.  
 Davey Tree Expert Co., Kent, Ohio.  
 Davison Chemical Corp., Baltimore, Md.  
 Eastern States Farmers' Exchange, Springfield, Mass.  
 Thomas W. Emerson Co., 215 State St., Boston, Mass.  
 Excell Laboratories, 221-223 East 26th St., Chicago, Ill.  
 Florida Humus Co., Zellwood, Florida.  
 Flower City Charcoal Co., 135-49 Colvin St., Rochester, N. Y.  
 Flower City Plant Food Co., Inc., Pittsford, N. Y.  
 Foodrink Fertilizer Co., 25 Fair Oaks St., Cambridge, Mass.  
 Ford Motor Co., 3674 Schaefer Road, Dearborn, Mich.  
 H. L. Frost & Higgins Co., 20 Mill St., Arlington, Mass.  
 Garden Hose Spray Co., Inc., 292 Main St., Cambridge, Mass.  
 Gould & Olen, Inc., 140 Liberty St., New York, N. Y.  
 Thomas J. Grey Co., 16 South Market St., Boston, Mass.  
 Dr. Heinz Co., College Hill, Cincinnati, Ohio.  
 Allen Hersom Co., New Bedford, Mass.  
 A. H. Hoffman, Inc., Landisville, Penn.  
 Humphreys-Godwin Co., Memphis, Tenn.  
 A. W. Hunt, Weston, Mass.  
 International Agricultural Corp., 38 Chauncy St., Boston, Mass.  
 John Joynt, Lucknow, Ontario, Canada.  
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo, N. Y.  
 L. B. Lovitt & Co., Memphis, Tenn.  
 Lowell Fertilizer Co., 178 Atlantic Ave., Boston, Mass.  
 McClain Brothers Co., Canton, Ohio.  
 Master Meat Products Co., 2500 22nd St., Detroit, Mich.  
 Menderth, Inc., 126 State St., Boston, Mass.  
 Merrimac Chemical Co., Everett Station, Boston, Mass.  
 New England Rendering Co., Rear 39 Market St., Brighton, Mass.  
 New England Toro Co., 1121 Washington St., West Newton, Mass.  
 N. V. Potash Export My., Inc., of Amsterdam, Holland, 19 West 44 St., New York, N. Y.  
 Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.  
 Olds & Whipple, Inc., Hartford, Conn.  
 Organic Fertilizer Corp., 120 Broadway, New York, N. Y.  
 Pacific Manure & Fertilizer Co., 108-110 Davis St., San Francisco, Cal.  
 F. G. Phillips Co., 37 Circuit Road, Dedham, Mass.  
 Plantabbs Corp., Baltimore, Md.  
 Plantspur Products Co., Inc., Ridgefield, N. J.  
 Premier Poultry Manure Division, North American Car Corp., 327 South La Salle St., Chicago, Ill.  
 Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago, Ill.  
 John Reardon & Sons Co., 51 Waverly St., Cambridge, Mass.  
 Rogers & Hubbard Co., Portland, Conn.  
 N. Roy & Son, Rear 618 Newport Ave., South Attleboro, Mass.  
 F. Rynveld & Sons, Inc., 149 West 24th St., New York, N. Y.  
 Salem Chemical & Supply Co., Salem, Mass.  
 O. M. Scott & Sons Co., Marysville, Ohio.  
 Sewerage Commission of the City of Milwaukee, P. O. Box 2079, Jones Island, Milwaukee, Wis.  
 Soil Builders, Inc., Division of Colloidal Products of America, Inc., 319 First National Bank Bldg., Orlando, Florida.  
 Southern Cotton Oil Co., Atlanta, Ga.  
 Standard Wholesale Phosphate & Acid Works, Inc., Baltimore, Md.  
 George Stevens, 364 Mark St., Peterborough, Ontario, Canada.  
 Stockdale Fertilizer Co., Morris, Ill.  
 Sutton & Sons, Ltd., Reading, England.  
 Swift & Company Fertilizer Works, 1305 Standard Oil Bldg., Baltimore, Md.  
 Swift & Company Oil Mills, Atlanta, Ga.  
 F. Sylvester & Sons, 86 Baxter St., Melrose, Mass.  
 Synthetic Nitrogen Products Corp., 285 Madison Ave., New York, N. Y.

Tennessee Corp., Lockland, Ohio.  
Universal Chemical Co., 106 Ontario St., Lynn, Mass.  
Virginia-Carolina Chemical Corp., Richmond Trust Bldg., Richmond, Va.  
Walker-Gordon Laboratory Co., Inc., Plainsboro, N. J.  
C. P. Washburn Co., Middleboro, Mass.  
W. W. Windle Co., 95 West Main St., Millbury, Mass.  
Winslow Nurseries, 1808 Great Plain Ave., Needham, Mass.  
Thomas Wood & Sons, Inc., 12-14 Midland Ave., Montclair, N. J.  
Woodard Bros., Greenfield, Mass.  
F. H. Woodruff & Sons, Milford, Conn.  
Wright Co., Old Bridge, N. J.



